THE PRACTICAL PHOTOGRAPHER

(LIBRARY SERIES)

EDITED BY REV. F. C. LAMBERT, M.A.

NUMBER 5

The Pictorial Work of
F. H. Evans.

P.O.P.

Gelatino-Chloride P.O.P.
Collodio-Chloride P.O.P.
Self-Toning P.O.P.

Printing,
Toning,
Developing,
Glazing,
Etc.

Enlarging Competition Awards.
Illustrated Print Criticisms.
Spring Junior Salon.
Numerous Illustrations.

PRICE 1/- NET.

HODDER AND STOUGHTON.
27, PATERNOSTER ROW, E.C.

The Practical Photographer.

Library Series. **P.O.P.** **No. 5.**

Principal Contents.

Illustrations.

Editorial and other Notices.

Notice.—Mounting Competition; an important correction.—By an unfortunate oversight the closing date of this competition was printed in our last number as January 31st. This should be corrected to March 1st.

Contents of Our Next Number.

The sixth number of the present (Library) Series of *The Practical Photographer* will deal exhaustively with the all-important subject of **Developers and Development.**

This number will contain several choice examples of the fine Pictorial work of **Ernest R. Ashton,** together with numerous practical articles by experts on the subject of Development, etc.

This number will also contain several specially prepared instructive illustrations. (*Ready March 1st.*)

Our Seventh Number will deal fully and exhaustively with the important subject of the After-Treatment of the Negative, Intensification, Reduction, Re-development, Defects, etc. (*Ready April 1st.*)

Other Numbers in active preparation will be devoted to **Hand-Camera Work, Platinotype, Carbon, Gum-bichromate, Architecture, Landscape, Portraiture, Flower Photography, Photo-microscopy, Tele-photography, etc.**

Intending Contributors.—An Invitation.

The Editor will be pleased to give careful consideration to contributions connected with any of the above subjects.

For hints, instructions and suggestions to intending contributors, see page iv. of this number.

Previous Numbers.

Number 1.—Six choice examples of the Pictorial Work of A. Horsley Hinton. **Bromide Printing,** Toning, Border Printing, Moonlight Effects, Mounting, Cloud Printing, Pictorial Consideration, etc. (by Hodges, Somerville, Lambert, Chapman Jones, Allen, Clark, etc.).

Number 2.—Eight choice examples of the Pictorial Work of Colonel Gale. **Bromide Enlarging,** Optics of Enlarging, Finishing Enlargements, Enlarged Negative Making, Toning Bromides, Bolting Cloth, Making Large Dishes, etc. (by Hepworth, Piper, Hewitt, Bennett, Lambert, Burton, etc.).

Number 3.—Eight choice examples of the Pictorial Work of Will A. Cadby. **Lantern Slide Making,** Toning Slides, Cloud Printing, Exposure, Development, Framed Slides, Diagram Slides, etc. (by Perkins, Hodges, Lambert, Piper, Marriage, Henderson, Allen, etc.).

Number 4.—Seven choice examples of the Pictorial Work of Alex. Keighley. **Mounting, Trimming, Titles** (Choice of, Inscribing, etc.), **Frame Making** for Amateurs, **Gilding** for Amateurs, **Hanging** Pictures, Home-made Albums, etc. (by Hewitt, Keighley, Cadby, Carpenter, Lambert, Wood, Moon, Dale, Hill, etc.).

Other Notices—Junior Salon, Awards, Coupon, etc.—see pages iv., v., vi., etc.

Notice to Correspondents.

Will Correspondents, Querists, and Senders of Prints for Criticism, please let us have their communications before the *15th of each month*, so that we may do our best to reply in the succeeding number.

Spring Junior Salon.—25th March!

The last day for receiving prints for our Spring Junior Salon is *The 25th Day of March*. A Special Coupon will be found in the March number. Prints may be of any size, subject, or process, mounted or unmounted. Technical as well as pictorial merit will count. A number of Silver and Bronze Plaques and Certificates on Japanese Vellum will be placed at the disposal of the judges, who are **Professor G. A. Storey, A.R.A.**, and the Editor of *The Practical Photographer*.

Criticism of Prints.

It is our intention to make the criticism of prints a special feature in our pages. The Editor will give his personal careful attention to this matter, and will aim at making every criticism a practical, interesting, and instructive object-lesson. By paying attention to the hints thus given, often a poor print may be improved and a good print followed by one still better. In order to encourage readers to take great care in the preparation of the prints they send us, we shall offer **Three Prizes of Five Shillings** each for the three best prints sent in each month. The winning prints will not be returned.

To meet the convenience of those readers who are preparing prints for special dates (exhibitions, etc.), and cannot conveniently wait for printed criticism in our columns, we have arranged that readers may send us one, two, or three prints with the usual Print Criticism Coupon and a few of 2s. 6d. for each print sent. Within a week the prints, accompanied by a type-written criticism, will be returned to the sender. The return postage must be prepaid in the usual way as in Rule 5. The special fee, 2s. 6d., should be sent in a separate envelope, with name and address of sender, and *not* with the prints for criticism.

Hints for Intending Contributors.

The Editor will be pleased to carefully consider MS. bearing on any of the subjects announced. Preference will be given to MS. characterised by the following features:—

1. New or little known methods; formulæ personally tested.

2. Short sentences and simple language, with diagrams when needed.

3. Brevity so far as is consistent with clearness. The first and last pages of the MS. should bear the sender's name and address. The approximate number of words should be stated. Contributors may, if they please, send a brief outline or synopsis of their proposed contribution.

The Editor cannot undertake any resposibility whatever in connection with MS., but if stamps are sent for return postage, he will endeavour to return as quickly as possible any MS. not accepted for publication. MS. should reach the Editor not later than **six weeks** before date of publication.

Intending contributors will also find that it saves themselves trouble if they will send to the Editor an *outline* of their proposed communication at the earliest possible date, so that arrangements may be made to avoid overlapping by two or more contributors saying the same thing. In this first communication any proposed diagrams may be merely rough sketches.

In general it is well to put any drawings or diagrams on separate sheets, and not interpolate them with the matter.

The MS. pages (which may preferably be typewritten) should have a clear margin of quite an inch left blank along the left-hand side of the page.

NOTE.—It would frequently save disappointment and the return of MS. if authors would state their willingness for extracts to be made from their contributions if the contribution cannot be accepted in its entirety owing to overlapping or duplication of portions by other contributors.

This Coupon Expires February 29th, 1904.

THE PRACTICAL PHOTOGRAPHER. COUPON NO. 9.

Prints for Criticism.

RULES.

1. Write legibly, on one side of the paper only.
2. Put your name, address, and a number on the back of each print, and enclose this coupon.
3. Do not send more than three prints with one coupon.
4. State the *Month*, *Hour*, *Light*, *Plate Speed*, *Stop*, *Exposure*, *Developer*, *Printing and Toning* process employed.
5. If prints are to be returned, a stamped and addressed label or envelope *must* be sent **with the prints.**
6. The Editor reserves the right of reproducing any print sent in for criticism.
7. Prints should be addressed :—THE EDITOR OF *The Practical Photographer* (Print Criticism), 27, PATERNOSTER ROW, LONDON, E.C.

THE PRACTICAL PHOTOGRAPHER. COUPON NO. 10.

P.O.P. Competition.

Name .....

Address .....

.....

.....

WRITE LEGIBLY.

This Coupon Expires March 31st, 1904.

P.O.P. Competition.

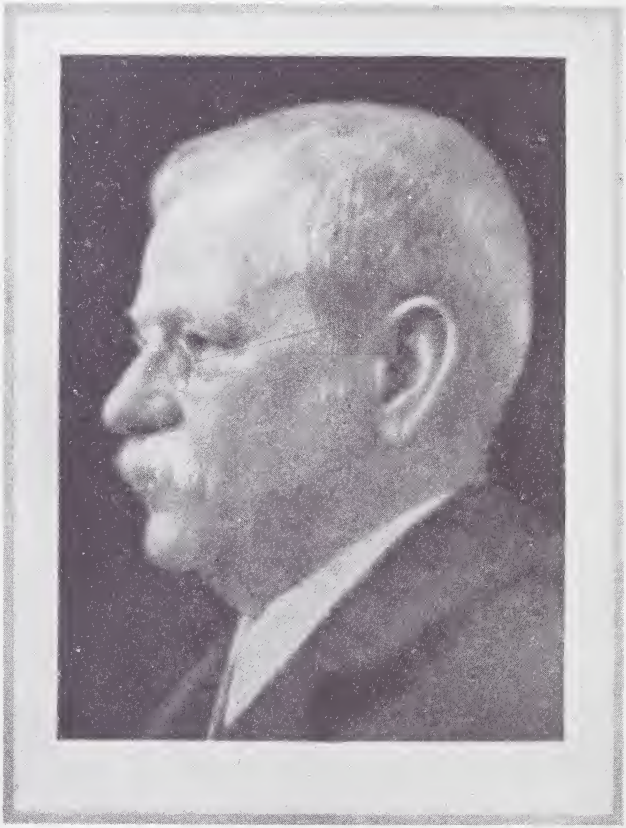
A Silver Plaque, Bronze Plaque, and Certificates will be placed at the disposal of the Judges.

1. This competition is designed to direct the attention of readers to experiments in connection with P.O.P. Marks will be given for successful examples of any of the methods contained in this number; or any useful modification; or any other helpful methods of the treatment of P.O.P.
2. Prize Winning Prints will not be returned. Others will be returned *if* a properly stamped and addressed envelope or label be sent **with the prints** and coupon in this number.
3. Each print should bear its title and name of producer, and be accompanied by a legibly written brief description of its preparation, viz. : Printing, Developer, Toning Process, Brand of Paper, Light, etc., etc.
4. Competitors may submit one or two or three (but not more) prints with each coupon. Two prints from the same negative may be used to illustrate ordinary and artistic treatment.
5. The Editor reserves the right to reproduce *any* print sent in to the competition.
6. Prints may be sent in any time not later than April 1st, 1904, addressed :—

The Editor of *The Practical Photographer*,

(P.O.P. Competition),

27, Paternoster Row, London, E.C.



Portrait of Professor G. A. Storey, A. R. A.

THE PRACTICAL PHOTOGRAPHER.

Library Series. **No. 5.**

The Pictorial Work of Frederick H. Evans.

By THE EDITOR.

MR. EVANS is probably known to most of my readers as an exponent of architectural photography, pictorially rather than topographically treated. That is true enough as far as it goes, but that is not very far down the list of his doings, for Mr. Evans is a man of various sides. The present series of illustrations have been chosen with no little care in order to show that in his photography—and that is only one of his various activities—he has a wider horizon than many are in the habit of supposing. At a glance we may see him as a portraitist, a landscapist, an architecture-"ist," and a maker of graceful decorative designs. Doubtless there are yet half a dozen other sides of his photography which are only waiting to be brought forward.

He is also probably known to not a few as an enthusiast in the matter of the making of mounts by cutting out and super-imposing pieces of tinted papers in the manner technically described on pages 14 and 22 in the preceding number of this journal. This method of mounting is sometimes wrongly called the American style. The explanation of this misnomer seems to be, not that the method originated in America, but that the majority of suitably tinted papers on the English

market at the present time are of American manufacture. This method is in origin "quite English," and was used for mounting water colour and pencil drawings before the days of photography. The system beyond question is capable of yielding excellent results when reticence and taste are brought to bear upon it, but there is a danger, as with all good things, of using it not wisely but too well, that is in multiplying the number of lines and spaces round the print to such an extent as to quite over-power the print which these surroundings are designed to show off to best advantage. It is interesting also to note that while Mr. Evans practises pictorial photography of a very high order, at the same time he preaches and practises the doctrine of fine technical quality as well. If we mistake him not, he has but little sympathy with faking or dodging, and we can well imagine him saying that the best after-treatment for a poor negative is the *intro*-duction of the coal hammer or something of a similar forceful and final character. Such an attitude is greatly to be commended in these days when photographers seem disposed to range themselves into two opposing camps, viz.: those who say—Get your print by any means you like, only get it, pay little or no attention to the negative, rely on introducing personality by control printing, dodging, faking, and anything you please. Let the art side overrule the craft side. And those who say—Give us pure photography or nothing at all, away with all control, retouching, after-treatment. Here, as always, extremes are more apt to be vicious than virtuous. The essence of the matter seems to be that every art process is based upon a craft. This craft by itself cannot be art, but still art must have a craft as foundation. The above two opposing class cries are of course exaggerations, yet may be taken as the logical sequence of much common talk among photographers. Instead of giving quite so much time to the controlling of a poor negative, would it not be wiser to try and make a better one which would call for less control? At the same time, if by judicious control of the best possible negative one can get a better result than that of the so-called

"straight print," how can it logically be denied that this is not the better craftsmanship. Control of printing is just as legitimate as control of lighting, of exposure, of development, of trimming, mounting and framing.

Fine architecture has been variously called frozen music, poetry in stone, a silent orchestra, etc. Each of these phrases is an attempt to convey a suggestion of the impression that any great human work is likely to have upon other human minds.

The architectural work of Mr. Evans doubtless will be a help to understanding this. It will easily be seen that not only is Mr. Evans an artist, but also a skilful craftsman.

Following our usual plan, we take the pictures accompanying these notes in their chronological sequence.

Wells Cathedral; Across the Nave.—This study at once strikes the key-note of the architectural style of the man. In this instance the scale of tone is short, and pitched in a somewhat high key. The first impression of this picture is Light, and the next is Space, the harmonious tone and rendering suggesting the former, the simplicity of general arrangement of mass greatly helping the latter sentiment. One can well imagine the air filled with that invisible fine dust which under certain atmospheric conditions, seems to convey the impression that there is more light inside a building than there is outside it, although our logical faculties tell us that this cannot be the case.

In Epping Forest.—A picture showing us that our artist can enjoy the untouched beauties of natural form as much, if not more, than the finest handicraft of man. One of the oldest theories of the origin of the Gothic arch is that it was suggested to man by the overarching and meeting of the branches in a forest. Be that as it may, all contemplative people must have noted within themselves the similarity of mental suggestion produced by the lofty pillars of some grand old cathedral and the company of a group of forest giants. Note here the wise choice of a simple foreground and concentration of attention on the varied and contrasted trunk forms.

Ely Cathedral; S.W. Transept.—In tonal arrangement quite a contrast to the first noted study. Here our range is from black to white, with a full scale throughout. The highest light and strongest dark are artfully brought together, so enforcing each other. The skilful rendering of the texture, quality, and aging of the stones in the nearer portions should be carefully noted. The enrichment of the Norman arch keeps our attention in the central part of the picture. But its severity of style does not draw attention away from the charm depending on chiaroscuro.

A Portrait.—And let it be said also an excellent likeness as well. For be it noted the two do not as often go together as one could wish. The captious critic may say that the size of the head is too large for the picture space. The excellent modelling of the features should be noted, and while no part is microscopically sharp, no part is noticably diffused. Note also that the collar is not blank white paper, as this part of man's clothing is usually rendered—but it has its own tone value. The expression and pose are suggestive of a thinker and observer. The lighting is broad and soft, while the dark background serves as one end of the tone scale, and greatly helps the value of the dark coat and white collar at the other end of the scale.

Bourges Cathedral.—This is the only bit of architectural exterior in this series, and therefore has special interests of its own. The converging perspective lines of the building on either side of the quiet street agreeably lead our attention to the chief thought, not the nearest part of the picture, *e.g.*, the cathedral itself. Presumably the design of this picture is to convey a general impression of the dignity and grace of this building as seen when bathed in soft sunlight. The ladder resting against the near house on our left is a happy "incident" affording an agreeable variation of direction of line, without being in any way a self-attractive feature.

Decorative Study.—Here we have Mr. Evans in yet another vein. This is altogether a charming bit of decorative form. The tone scheme is wisely

ACROSS THE NAVE. WELLS CATHEDRAL.

kept very simple. Indeed one might almost say the whole design is a study in grey against a dark background. Thus our appreciative attention can the better be given to the form and line of the composition. This example well shows balance of line as well as of form.

York Minster; West-end Nave.—York Minster is at once a difficulty and a delight to every photographer. It seems so full of possibilities and difficulties, side by side, that one is often found wishing for slight alterations. In this instance one could wish that the lines of light and dark in the clustered columns to our right, were either not so many or not so strongly contrasted. For they seem to snatch more of our attention from the finely rendered more distant portions than these lines of alternating light and dark really deserve. In this and the next example, Mr. Evans exemplifies the great value of a view-point somewhat nearer the floor than is generally employed. Quite a large proportion of good interior studies are largely spoiled by a view-point too high above ground.

In Bourges Cathedral.—This is again a valuable object lesson in the form of a simple composition, a broad scheme of lighting, and the wise choice of a tone range in harmony with the subject. The grandeur and dignity of these shafts of sunlit stone at once suggest lofty thoughts and noble ideals.

Very reluctantly do we find ourselves at the end of these impressive studies of Mr. Evans. Contrasting his work with the usual tourist specimens of these grand old buildings, we see how he has entered into the spirit of those men of old time who were content to spend life doing one thing and doing it well. There is a simplicity, a quiet strength, and obvious absence of sophistication about these studies that should serve as a useful and helpful stimulus to those who think that because someone else has been over the ground before, there is therefore nothing left for them.

Practical Introduction to the use of P.O.P.

By R. W. COLE, B.A.

IT would be invidious to extol any special brand of paper when most, if not all, are of such excellent quality. They are the same price, and may be treated in a similar manner as regards toning, fixing, etc.

Handling the Paper. The paper must be stored in a cool, dry place. The sensitive surface must not be allowed to come into contact with the hands. The sheets should always be taken up by the corners or edges.

The Negative. The negative must be quite dry and should have been well washed after fixing. If the washing has not been sufficiently thorough, the hyposulphite of soda will effloresce in white patches on the surface of the gelatine, and if allowed to come into contact with the paper, will cause a yellow stain. Should such an effloresence occur, it must be removed by soaking the negative in several changes of water.

The negative should be dusted with a soft handkerchief or brush before it is placed in the printing frame. When a sheet of P.O.P. is taken out of a packet, the back should be lightly tapped to shake off small clippings which are liable to adhere to it and would cause white marks on the print. The negative is carefully examined before it is placed in the printing frame to see that there is no dust, hair, etc., on it. The sheet of P.O.P. is immediately laid on it, and the back fastened down.

Printing. Negatives of average density should not be printed in direct sunlight, since strong light tends to obliterate detail. Very dense negatives must, however, be printed in direct sunlight. But in winter, when sunlight is weak, even thin negatives may be printed in direct sun-

light without harm. The frame can be placed in a sloping position on a window-sill facing the sky, care being taken not to allow rain-drops to fall on the back of the negative, or they will make dark spots on the print by concentrating the light. When the printing frame is placed in a window, rain-drops or spots on the window glass will also make patches on the print.

The time taken to print varies from a few minutes to several hours, the actinic value of light varying with the time of year, time of day, quantity of moisture in the air, cloudiness of sky, etc. As a rule, the prints should be a little darker than required when finished, since washing, etc., tends to make them somewhat lighter.

Some brands of paper print to a reddish tone, others to a blue, purple, or brown tone, and it requires some experience to judge when the proper tone has been reached with a particular negative. Hence it is always best for the tyro to keep to one brand of paper. Sometimes the same piece of paper will exhibit a mixture of red, brown, or bluish tones, but these will become uniform during the subsequent process of toning.

Storage of Prints. When each print is removed from the frame, it should be quickly put back into the packet and kept in a dry place under slight pressure. Prints must never be placed between printed paper. Very convenient cases for the storage of prints are sold. These are oblong metal or cardboard boxes (holding a large number of prints) and fitted with a spring which always keeps the prints flat.

It is not desirable to keep prints too long before toning, for the reduction of silver which has been caused by light seems to continue in the dark, and the prints thus become darker, or may be disfigured by local patches.

Washing. Whilst washing and toning are being performed, scrupulous cleanliness both of hands and dishes must be observed. The prints must only be taken up by their edges or corners. To economise time and chemicals, it is best to deal with prints in batches. Thus, 24 quarter-plate, 12 half-plate or 6 whole-plate prints may be

dealt with at one time. Do not be tempted to exceed this number. Without special appliances, prints are liable to be spoilt by over—or under—toning, insufficient washing, etc. A large basin is a convenient utensil for washing prints in, but a large photographic dish about 15 × 12 will serve. The basin, or dish, is first washed out with hot water. then filled with cold water, and the prints placed in it one by one. Dry prints must never be handled with wet fingers or finger-marks will result. The water is stirred round with the hand until it becomes milky, when it is *all* emptied out and the basin refilled. This process is continued for ten minutes, or until the water remains quite clear, care being taken not to allow the prints to stick together and to keep them moving all the time. It is not a good plan to place the prints in a basin under a running tap because the white chloride of silver remains at the bottom amongst the prints and is not washed away.

Toning Baths. Toning may be effected with gold, platinum, or the combined toning and fixing bath. The following are some useful formulæ for toning solutions :—

I. Stock Gold Solution.

Gold chloride	15 grs.
Distilled water	15 drs.

No. 1

Ammonium sulphocyanide	60 grs.
Water	20 ozs.

No. 2.

Stock gold solution	5 drs.
Water	20 ozs.

For use, take equal quantities of Nos. 1 and 2.

II. No. 1.

Ammonium sulphocyanide	100 grs.
Water	10 ozs.

No. 2.

Sodium sulphite	10 grs.
Water	10 ozs.

No. 3.

Gold chloride	15 grs.
Water	15 ozs.

For use, take 2 ozs. of No. 1, 1½ ozs. of No. 2, 2 ozs. of No. 3, and 16 ozs. of water.

In Epping Forest.

Toning. The conditions for successful toning are scrupulous cleanliness, continual motion of the prints (preventing contact of prints), and prevention of air bubbles clinging to the surface of the paper. All dishes used for toning should be washed out with hot water before use. As the least trace of hypo retards toning and stains the prints, it is best to keep all hypo out of the way until toning is finished. One method is to use two dishes filled about ½-in. deep with toning solution. First place a batch of 6 or 8 prints in one of these. Then transfer to the other dish and back again until the required tone is obtained.

Toning must be done in weak daylight, or preferably by artificial light, the former is variable whilst the latter can be made constant and renders judging the proper tone more easy. When toning commences, the prints have an unpromising orange-yellow or reddish-brown colour. Then they pass through various shades of red and finally become slaty colour. If a warm brown or red tone is required, toning should be stopped during the red stage, but if a cold or dark tone is required, it should be stopped when the red colour, as seen by transmitted light, has almost changed to bluish-black. If it is stopped when the red is partly changed to blue, the finished print will present the unsightly appearance of double toning. When a print has acquired the right tone, it should be washed immediately and placed in a basin of clear water. If there is no time to wash, the prints may be placed in a dish of water in which a pinch of table salt has been dissolved. This will stop the toning which might otherwise continue. Warm tones can be obtained by adding sodium sulphite to the toning bath (when the latter does not already contain it) in the proportion of 1 grain to 10 ounces of solution.

When the solution is of the right strength and other conditions have been complied with, it should take from five to eight minutes to tone a print. When the prints change to a bright yellow colour and refuse to tone, it shows that the gold in the solution is becoming exhausted. The solution is

either replaced by a new bath, or chloride of gold added. The quantity required depends on the amount of solution in use and the formula which has been employed. It averages about 1 grain of gold (dissolved in 1 oz. of water) to every 12 ozs. of solution. The prints should always be taken out of the solution whilst more gold is added. This strengthening of the bath may be repeated, and some baths improve with age, but the liquid must be thrown away as soon as it becomes cloudy or discoloured. In cold weather some brands of paper tone very slowly, hence the temperature of the solution should be raised to between 60° and 70° *F.* by adding hot water.

Another method is to place half-a-dozen dishes in a row, put one print at a time in each, and continually rock all the dishes. Thus there is no contact between the prints, air bubbles can be detected and brushed aside, and the process of toning can be carefully watched. If half-plate prints are being toned, two can be placed side by side in a whole-plate dish, and if the latter is rocked carefully, they will not slide over one another. The rocking can be made almost automatic by procuring a piece of board long enough to hold the requisite number of dishes, and glueing blocks of wood to it to make seats for the dishes. This is pivoted at both ends and the pivots rest in bearings on a table. If a heavy weight is attached by a strip of wood to one end, and hangs over the edge of the table so that it nearly touches the ground, it will continue the rocking whilst the operator is otherwise engaged.

Large Prints of whole-plate and larger sizes are troublesome to wash and tone on account of their liability to stick to one another. These are best treated by washing two side by side in a large dish, then pouring the toning solution on and rocking. While the toning is proceeding two more prints may be washed in separate dishes.

It is not advisable to tone two or more prints in one small dish and trust to the movement of the liquid to effect even toning. Even if the prints are continually sliding over one another the toning will be uneven, and red and dark patches will

appear. If double toning does not result (and it will not necessarily do so if the toning is carried far enough), a greater quantity of gold will be used.

Fixing. When the toning is finished, the prints must be well rinsed and placed in the fixing solution. This consists of 4 oz. of hypo to a pint of water, and in districts where the water is hard, rain or distilled water should be used. Not more than six prints should be placed in one fixing bath at a time, and the dish should be continually rocked to prevent the prints sticking together. The time taken to fix varies from ten to fifteen minutes. Excessive fixation tends to reduce the prints. When all the the prints have been fixed, the hypo should be thrown away. It is false economy to put it back into a bottle.

Hardening. **Alum Solution.**—After fixing, the prints are again well washed in running water. Smaller sizes up to half-plate can be washed by holding on the palm of the hand and turning up front and back alternately. Larger sizes must be held by the edges by both hands, and moved under the tap, care being taken that the print is not torn by the force of the water. When well rinsed, the prints are placed in a solution of alum (two oz. of alum to a pint of water). Alum hardens the film by rendering the gelatine insoluble in water. It should always be used in hot weather, or if the prints are to be mounted. In very hot weather prints should invariably be placed in the alum solution after the preliminary washing, otherwise there will be risk of damaging the soft gelatine surface. In such cases the prints must be thoroughly washed before they are transferred to the toning bath.

Final Washing. Each print, when taken out of the fixing bath, should be held under the tap for two or three minutes, and then placed in a basin of water. When all the prints are washed, the basin is placed under a running tap for two or three hours. There are several appliances for washing prints in the market. These ensure continual motion of the prints and circulation of the water. In the absence of a tap and sink, the best

way of washing prints is to place them all in a basin of water and change the water every quarter of an hour for two or three hours. Every trace of hypo must be eliminated to ensure permanency of the prints.

Drying Prints. In performing all the operations connected with toning, it must be remembered that prints dry slightly darker. If a glazed surface is not required, the prints are taken out of the water, allowed to drain, and placed on blotting paper. Surplus moisture is removed from the surface by lightly pressing on another sheet of "fluffless" blotting paper, which *must be removed immediately.* The prints are then left to dry on a stout sheet of cardboard, or may be pinned or clipped on to a piece of stout string stretched across a room. It is a mistake to dry rapidly by placing near a fire or in a hot room. When dry, the prints are placed between sheets of white paper and pressed flat. Prints dried in this manner will probably require subsequent burnishing.

Glazing. A glazed surface is obtained by squeegeeing the wet print, when the washing is finished, face downwards on to a ferrotype sheet or piece of plate glass. The surface of the plate should be polished by a solution made of :—

Spermaceti wax	30 grs.
Benzine	5 ozs.

Plate glass gives a more highly glazed surface and can be polished with French chalk instead of the wax solution. A matt surface is obtained by squeegeeing the wet print on to a sheet of finely ground glass, previously polished with French chalk. The prints must be allowed to get quite dry on the ground or plate glass, when they may be peeled off by raising one corner.

Combined Toning and Fixing Bath.—This process cannot be recommended. It does not really save much trouble, and the results are not always satisfactory.

Ely Cathedral. S. W. Transept.

Practical Notes on Gold Toning.

By F. C. BURTON.

SOMETIMES it happens that the beginner's first few results are far better than the second or third batch. This may first puzzle and then discourage him, because, not knowing the principles underlying the process in hand, he is apt to spend much time and trouble in looking for the cause of the trouble in quite a wrong direction.

Principles of Gold Toning.—Crudely put, we may imagine the operation of toning to be that of changing the atoms (or molecules) of one kind for another. Thus, supposing the image of our printed picture to consist of atoms of silver, we should, in gold toning, replace some (or all) of the silver atoms by gold atoms. Now, "Chloride of Gold" may exist in two forms (1) as auric or trichloride ($Au Cl_3$), and (2) as aurous or monochloride (Au Cl). Photographers are familiar with the fifteen grain tubes of yellow crystals of the auric or trichloride form. If this be used for toning as a simple aqueous solution which is usually slightly acid, one gold atom replaces three silver atoms, and hence the picture is made very much lighter by this method which has the further disadvantage of being very slow. If to the normal acid solution a *small* quantity of magnesia, whiting, powdered marble or chalk be added, a neutral solution may be obtained. In this state, toning is slow, but the image is not so markedly reduced as before. If a suitable alkali be added in small quantity to the trichloride solution, aurous or monochloride is formed. This tones in much shorter time, and also in this case one atom of gold replaces one atom of silver, so that the image or picture is not greatly reduced. If excess of alkali be added, aurous oxide is formed, and this readily parts with its oxygen and deposits metallic gold. Hence it will be seen that toning is an operation requiring due care in accurately adjusting

the proportions of the constituents of the bath. Potassium and ammonium sulphocyanide are among the many ingredients used for toning. Solutions of either of these salts soften (and in excess dissolve) gelatine. Hence another reason for accuracy in preparing the toning bath. Roughly stated, the proportion of sulphocyanide should not be less than $1\frac{1}{4}$ times and not more than 20 times the quantity of gold chloride.

To convert one grain of trichloride to the "aurous," or desirable condition for toning requires $\frac{9}{10}$ grains of soda carbonate—while $1\frac{1}{2}$ grains would be excessive. A very suitable proportion is 1 grain of the carbonate for each grain of the chloride.

The stock solution of gold chloride should be made by dissolving the contents of a 15 grain tube of chloride in 15 drams of distilled water. To this should be added 3 grains of precipitated chalk, or a like quantity of finely powdered white marble. Part of this will be dissolved by the excess of acid. The residue may be left as a harmless sediment in the bottle. Gold in solution should be kept in the dark. If warm colours, *i.e.*, reds and red browns, are required, add a little more water to the bath. If colder tones, *e.g.*, purples and blacks, are wanted, use rather less water in making up the bath.

Preparing the Bath.—The gold chloride must be added slowly to the sulphocyanide (with constant stirring), and *not vice versa*. The sulphocyanide bath should not be kept for more than a few hours at most, and even for that time should not be exposed to daylight. The proportion of sulphocyanide to gold should be about 10 or 12 to 1. Increasing the sulphocyanide tends to yield yellow prints and soften the gelatine. Increasing the gold quickens its action and yields bluer colours. Low temperature retards toning. The best results are obtained between 65° and 70°F.

Quantity of Gold required.—Dark prints require more gold than do light prints or vignettes. Roughly stated, this minimum allowance should be 1 grain of gold chloride per sheet (24×17) of paper, or say, 8 eight whole-plate prints, 16 half-plate, or 32 quarter-plate. But it is *wiser* to allow from $1\frac{1}{4}$ to $1\frac{1}{2}$ grains for these quantities.

Quantities of gold chloride and ammonium sulphocyanide required to tone one sheet, 24 × 17, or 8 whole-plate prints to certain colours.

Colour.	Gold.	Sulphocyanide.	Water.
Red ...	¼ ...	2½ ...	10 ozs.
Brown ...	½ ...	5 ...	10 ,,
Purple ...	1 ...	10 grains...	10 ,,

Times and Quantities.—It will be found a good useful rule to reckon one ounce of toning bath for each half-plate print, *i.e.*, two quarter-plate prints; also reckon ½ grain of gold per 8 ozs. of bath solution, *i.e.*, per 8 half-plate prints (*i.e.*, for warm purple brown colour less gold for red colour, more for blue purple colour). Time of toning should not be less than 5 minutes or more than 15 minutes. The best results are usually obtained in 5 to 10 minutes at normal temperatures.

Changes of Colour in Gold Toning.—The beginner is strongly advised to make from the same negative a series of, say, half a dozen prints of the same strength. Then to wash them thoroughly and tone in the same bath in the following way:—After immersion in the toning bath the prints turn a somewhat musty looking yellowish or orange. Withdraw one print and mark it A. Very shortly the prints will begin to return to their original red colour; when this stage is reached withdraw the second print, mark it B. The next stage is when the *lighter* parts are turning blue. This is readily seen by looking through the print. When the shadows are still red, withdraw print C. Continue toning until on looking *at* the print the shadows have lost their red colour, and are purple; but on looking through the print some red remains. This is the moment to withdraw print D. Then continue toning until all redness is gone, when the shadows are examined by transmitted light. This is the final stage E.

On fixing, washing and drying we shall probably find A a warm red brown. B will be less red and more brown. C will show double toning, *i.e.*, lighter parts blue and darker parts red. D should be a rich even purple, while E will be too cold and blue for most pictorial purposes. Hence we infer that

for warm even brown tones we must withdraw the print before the lighter parts turn blue; and for avoidance of double toning, we must wait until the shadows are no longer red when looked *at*, but still are red when looked *through*.

Control. — For even toning the print must be well washed, and especially when toning developed prints. By the addition of from $\frac{1}{4}$ to $\frac{1}{2}$ grain of sodium sulphite per grain of gold in the ammonium sulphocyanide bath, toning is made slower, and therefore less likely to be uneven. By increasing the proportion of soda sulphite to 1 grain per 1 grain of gold, the tone colours are more red and brown, not blue or purple.

Keeping Untoned Prints.—If prints cannot be toned within a few hours of their leaving the printing frame they should be put face to face and then wrapped up in blotting paper that has been previously soaked in soda carbonate (washing soda) one ounce, water one pint and then thoroughly dried.

"The Tone is in the Negative."—By this once familiar expression is simply meant that for rich purples and brown, a vigorous print, *i.e.*, one from a bright, clean, moderately plucky negative is required. If the negative be thin and poor in contrast then only the cooler bluish colours are likely to result.

First Washing.—It is essential for good results that the first washing should be done in quick changes of water. As soon as each print is thoroughly wetted the water should be changed. It is a good plan to wash each print singly under a spray on a sheet of glass.

Judging Printing.—The glossy print, when it leaves the printing frame, should be a *little* darker than the finished result is desired. Matt paper also requires to look a trifle darker than the stage for the glossy kind. Mounting in optical contact also makes the print look a little lighter than ordinary mounting. In printing the slight loss of strength should be allowed for.

Storage of Paper.—P.O.P. should be kept flat, under slight pressure in a dry and cool place, away from gas or fire fumes.

York Minster.

Double Tones: Cause and Remedy,

By C. J. DAVIES.

A FREQUENT cause of double tones on all forms of P.O.P. is the unequal size of the granular deposit of silver, due to printing in light of varying intensity.

If the print is started in diffused light and completed in sunlight, double tones will result unless special precautions are taken in the use of the toning bath as hereafter suggested.

Combination Printing.—The plan of printing in clouds from a second negative is a frequent source of double tones owing to the variable qualities of the two negatives, and also to the common practice of printing the cloud portion by direct sun and the view by diffused light.

Printing Under Green Glass.—Starting prints under green glass, a favourite practice fifteen years ago, was another fruitful source of two-colour toning, though there is no objection to this method if the prints are completed under the green screen.

Variation in Light.—The commonest form of procedure which leads to double toning is when frames are exposed during an afternoon light and completed in the strongly actinic light of the following forenoon. If the printing must be carried overnight, always endeavour to arrange that the more actinic light is made use of on the first day.

Temperature.—When the gold bath is compounded with warm water, a method usually adopted in cold weather, another form of double toning is frequently experienced; this is due to the solution cooling more rapidly at the sides and bottom of the bath than in the centre. Rocking the bath obviates this difficulty to a certain extent; but the best remedy is to place the toning dish in a shallow vessel of hot water, or if the sand bath is preferred, sink the dish slightly in the warm sand.

Toning Twice.—Another method which can be strongly recommended to avoid double toning is to employ two baths, and in this case the procedure is as follows :—

Having washed the prints in the usual manner, tone for about five minutes in a bath of the following composition—

Water	10 ounces.
Sulphocyanide of ammonium	15 grains.
Gold chloride	½ grain.

The prints must be rinsed, fixed and washed, and as soon as this is complete they may be again placed in the old toning bath, which should be previously renovated with another ½ grain of gold.

Sulphite of Soda.—The addition of sodium sulphite seems to have a favourable action in preventing double toning, and it is particularly useful where heavy deposits of gold are required. A satisfactory formula for such a toning bath is ;—

Water	8 ounces,
Ammonium sulphocyanide	15 grains.
Sodium sulphite	1 grain.
Gold chloride	1 grain.

Hardening Bath.—The favourable action of a hardening bath in preventing double toning is probably due to the slower deposition of the gold. Slow toning is undoubtedly desirable provided it be not due to deficiency of gold, or too low a temperature. A suitable hardening bath for use with P.O.P. is :—

Sodium chloride (table salt)	1 ounce.
Alum (potash)	1 ounce.
Water	40 ounces.

General Cautions.—Double tones may be due to insufficient washing. Some toning baths, however, require free silver in the print. Where cut sizes of P.O.P. are used the paper should be stored under pressure and in waxed wrappers, as the action of the atmosphere on the margins of the paper when loosely packed frequently leads to the production of uneven toning. Insufficient rocking, and neglecting to change the position of the prints in the bath are further causes which cannot be too carefully guarded against.

Over-printed P.O.P.

By H. C. STANDAGE.

BY the action of light some of the silver salt in the P.O.P. becomes reduced to the brown suboxide of silver. If too much of the silver salt be reduced, the proof is "over-printed." This silver suboxide is insoluble in water, and therefore cannot be washed out of the print. From experience I find that if one or two drops of pure nitric acid be added to two fluid ounces of gold toning solution (which will be sufficient to tone a quarter-plate) just before immersing the print therein, part of the silver suboxide will be cleared away, because the acid will convert the insoluble suboxide into soluble nitrate, which will be carried away in the wash-water.

Before proceeding to tone, the print must be washed in water in the usual way, so as to dissolve out of the emulsion all the silver salt that has not been acted on by the light, otherwise the resulting print when toned will have a pinkish tint. By the addition of the small amount of nitric acid to acidify the toning bath all excess of suboxide is removed, leaving only just sufficient in the P.O.P. to be replaced by the gold chloride of the toning fluid. Too much acid must not be used, otherwise all the silver salt in the P.O.P. will be converted into soluble nitrate of silver, and thus be washed out of the paper, leaving no silver salt to be replaced by the gold chloride, and as a result no picture will be represented on the paper.

Safe Handling of Paper.—When cutting up large sheets, or otherwise handling P.O.P., a pair of quite clean housemaid's gloves ("chamois") may be worn. These enable the worker to handle the paper much more freely without fear of finger marks. When not in use the gloves should be kept wrapped up in paper.

Glazing and Matting P.O.P. Prints.

By E. MARRIAGE, F.R.P.S.

THE fixed and washed prints are thoroughly dried before treatment. This hardens the film, which, after its prolonged treatment in various solutions, is in a very tender condition. Sheets of glass, *e.g.*, old negatives preferably larger than the print, are cleaned with soap and hot water, and polished with a dry cloth. They are next rubbed over with a rag and a trace of paraffin oil (just enough to give a smeary effect all over the glass without making it really greasy), then well polished with a clean cloth. A dry print is placed in a solution of formaldehyde (40 per cent. commercial 1 part, 8 parts water) and left there for two or three minutes, care being taken to avoid air bubbles. The prepared glass meanwhile has been placed face upwards in a dish of water. After the print has become thoroughly limp in the formaldehyde solution, it is put face downwards into the vessel containing the glass, and left for a few minutes for the excess of the solution to be dispersed in the water. The time may be occupied by polishing a second glass. Then arrange the print on the glass under water, and holding it down to the glass at two corners, raise the two together out of the dish. The held-down corners come out first. Place the glass with the print uppermost on a towel, laid on a flat table, and run lightly over it with a roller squeegee. This gets rid of most of the water, which the towel will absorb. Then place a piece of fine linen free from patterns (a clean pocket handkerchief answers admirably) on the print, and use the squeegee more firmly; this will dry the print partially, as well as secure perfect contact with the glass. The glass with the print attached is set up on edge to dry. Prints squeegeed at night are

Decorative Study.

generally ready to strip in the morning. It is better to dry them rather slowly. If dried quickly in front of the fire, they are rather liable to show marks, and will not lie flat. Prints hardened with formaldehyde keep their gloss well.

Matting Prints. This is generally done by squeegeeing to finely ground glass, but a much finer matt surface is obtained by first polishing the prints in the manner just described and then rubbing the smooth surface with pumice powder. This operation should be gone through before the print is trimmed. Pumice powder, which is conveniently stored in a cheap pepper castor, gummed paper (stamp edging) and some pieces of glass (*e.g.*, old negatives) are required. The glass must be slightly larger than the untrimmed print. The polished print is stuck down or bound round the edges carefully with the gum paper to the glass, and when the gum is dry again, some pumice powder is dusted on it and the print is then rubbed over with the tips of the fingers until all the polish is removed; a final wipe with a soft cloth removes the surplus powder, when the print can be detached and trimmed to its final shape.

Printing in Damp Weather.—The back and pad of printing frame should be dried. Also an old film negative, sheet of celluloid or piece of American oilcloth should be put between the back of the paper and pad of printing frame.

Spotting, *i.e.*, correcting spots or small patches which are too light in colour. This is usually done by applying water colours to match the surrounding tint. Ivory black, blue-black, indigo, lake, carmine, brown madder, are all useful tints for blending together, according to the colour required. The beginner will find it easier to begin his spotting experiments on matt surface paper. Use a small brush, and have it nearly dry—only just moist enough to convey colour. If used too wet the spotting will show irregularities.

Mounting P.O.P.

By I. R. DALE.

N the subject of mounting, mounts and mountants, the reader is recommended to have at hand No. 4 of this series, which deals with the general principles. There are, however, one or two points which especially concern the users of P.O.P., and which may be properly relegated to this volume.

P.O.P. prints are easily stained by solutions penetrating from the back, therefore, before using any new preparation for a valued print, first try its effect on one of less value. Starch paste, freshly made in the way already described in this series, is probably the most approved favourite. Stale starch paste that has decomposed or turned acid will probably produce stains or show mould spots ere long.

If prints have been glazed in the manner described on an another page and they are again wetted, or an aqueous solution used as a mountant and applied to the back of the paper, then the glazing effect will be lost. Therefore we must proceed as follows if the glaze is to be retained. Having laid the wet print on the sheet of glass or ferrotype plate, blot off the surface moisture from the back of the print with clean blotting paper (ink marks on the blotting paper will stain and spoil the print). Then paste down on to the back of the print a piece of waterproof paper one-sixteenth or one-eighth of an inch smaller than the print all the way round. Then, when print and water-proof backing are perfectly dry and stripped from the glazing plate, the position of the print is marked on the mount. A narrow band one-eighth inch wide of mountant is painted on the mount and the print laid in contact, so that the edges of the print come over the band of paste, and the print and mount put under pressure until dry. This robs the edges of the print of some of its gloss, but the

centre part is unaffected. Waterproof enamel paper for this purpose is obtainable from the photographic dealers.

When rubbing down wet prints on the mount a sheet of waxed or waterproof paper should be used. Blotting papers of all kinds are best avoided when dealing with gelatine surface prints. Any excess of mountant exuding from beneath the print on to the mount should be wiped away with a bit of very soft damp sponge.

Rubbing down after Mounting.—Gelatine prints must not be dried between blotting paper, as they would adhere to the paper. After pasting and placing on the mount they may be smoothed out by the aid of a bit of very soft sponge, or a sheet of waterproof paper laid over and a roller squeegee passed over this.

Mounting on Wood.—P.O.P. prints may be used for the decoration of box lids, fire screens, etc. The wood must be quite smooth and dry. Give a coating of gelatine 30 grains, water 1 oz. Allow this to sink into the pores of the wood and dry thoroughly. Then apply a second and if need be a third coating. The wood must show a slightly shiny surface of gelatine before the print is mounted. To mount the print soak it in a gelatine solution of the above strength (the print having previously been hardened, page 60) and then apply to the wood. Wipe off any gelatine from the face of the print with a small piece of very soft sponge moistened in tepid water.

Varnishing.—When the print is quite dry give it a coat of good quality copal varnish (obtainable at any artists' supply establishment) and allow to dry in a warm place free from dust.

Mounting P.O.P. as Opalines, *i.e.*, in optical contact.—This method is fully described in *The Practical Photographer* No. 4, page 35.

Mounting Prints on Celluloid.—Take an old celluloid film negative. Thoroughly clear away the film. Cut up into small shreds. To one ounce of amyl acetate add thirty grains of celluloid. When dissolved brush this on the print and apply it at once to the celluloid. Press into contact and wipe away any superfluous moisture with soft rag.

Tinting and Colouring P.O.P.

Tinting.—This falls under two heads. First: Tinting the paper of the print. Secondly: The local application of colour.

General Tinting may easily be done by making an aqueous solution of a suitable aniline dye (*e.g.* blue for moonlight effects, green for waves and sea, etc.,) and soaking the print in the coloured water. The penny packets of dye obtainable at the "oil shops" give us a convenient and cheap assortment of colours for preliminary trials.

Local Colouring, First Method.—Soak the print in water. Lay it on a sheet of glass. Remove all surface moisture by gently dabbing with a soft rag, and then supply solutions of dyes or transparent water colours with a brush. The great point in this method is to apply just the right strength of colour at one operation.

Second Method.—In one ounce of alcohol dissolve one dram of good quality white shellac. Allow any sediment to settle, decant off the clear part for use. If the print be small apply a thin coat of this quickly and evenly to the surface of the dry print. If the print be large it is better to use a spray diffuser. When quite dry water colours are applied. After the work is finished the surface is again sprayed.

Third Method.—Very thoroughly beat up the white of an egg to a froth. Let it settle, and filter off one ounce of this albumen. In 2 drams of water dissolve 24 grains of ammonia carbonate, add 10 minims of glycerine and 5 minims of ammonia. Finally add this to the albumen. Brush this evenly over the print and also use it as a medium for mixing the colours.

If preferred 20 grains of "dried albumen" dissolved in 1 oz. water may be used in place of the 1 oz. of filtered albumen. (See pp. 56-60, No. 1 of this Series).

Bourges Cathedral.

Platinum Toning P.O.P. for Beginners.

By F. C. LAMBERT.

DESPITE the general impression to the contrary platinum toning is easier and more satisfactory that gold toning, if the following very simple plan be used :—Wash the prints in 5 or 6 changes, and tone in : water, 10 oz. ; pot. chloroplatinite, 2 gr. ; phenyline-diamine hydro-chloride, 2 gr. This last constituent with the long name is bought as a light grey powder at about 2/6 per oz., so that 8 grains cost about one farthing. It is convenient to weigh out 8 grains and dissolve in one ounce of pure water yielding an acid orange solution. The 15 grain tube of the platinum salt (costing about 1/3) is broken and the contents dissolved in 15 drams of pure water. Thus for each 5 oz. of water we require 1 dram of each of our other two solutions. The prints change through warm browns to blacks. Bear in mind that they are considerably redder in the toning bath than when they leave the fixing bath. The beginner usually considerably over-tones and so gets cold black or blue blacks. (See Stop bath, page 62).

Another procedure.—Wash the prints in water 1 quart, table salt 1 oz. for 5 minutes, and again wash in clean water. Tone in water, 10 oz. ; phosphoric acid, 1 dram (or lactic acid, ½ dram) ; pot. chloroplatinite, 4 gr. Pass the (now acid) print into water, 20 oz. ; washing soda, 1 oz. for 3 minutes, wash and fixing in the usual way.

If the print in an acid condition were put into the fixing bath, the sulphur would be deposited in the pores of the paper and no amount of washing in water would remove this.

Platinum Toning of Matt Papers calls for no special notice beyond the fact that a matt paper dries a shade darker than a glossy one and seems also to lose more red in the toning bath. For these differences one or two careful observations should suffice.

The Chemistry of P.O.P.

By T. THORNE BAKER, F.C.S., F.R.P.S.

ONE characteristic of P.O.P. is that the image is visible. Several examinations of a piece of gelatino-chloride paper during its printing will reveal the image in increasing depth, and this "growth" of the picture is exceedingly interesting, not only in practice, but in chemical theory as well.

Salts of Silver. The three halogen salts of silver used in photography are silver chloride, bromide and iodide, and it is the first of these alone which concerns us in discussing printing-out papers. All three compounds become dark when exposed to light, changing in colour from white or creamy white to a bluish grey. Hence if silver chloride were used by itself for preparing a so-called gelatino-chloride paper, we should get simply a violet or bluish-grey image and not the familiar rich reddish-crimson colour. The varying quantity of chloride accounts for the colours in which different makes of P.O.P print out.

Manufacture of P.O.P. Broadly speaking, then, P.O.P. is paper coated with a gelatine or collodion film with which is incorporated, primarily silver chloride, free silver nitrate, and other agents as auxiliaries to printing. It is, of course, a well-known fact that P.O.P. contains free citric acid, which acts as a preservative. The formulæ vary very much, and as examples of the differences we might take two historical formulæ; thus a formula by Ashman and Offord contained silver chloride, silver nitrate, and silver citrate; whilst Barker's formula consists of silver chloride, silver nitrate, and silver tartrate. At one time silver oxalate was much advised, but in practice it has proved a failure.

Four Factors. It may be said, then, that in or combined with the film in P.O.P. we have the following agents :—

Silver chloride	The basis.
Silver nitrate	The auxiliary.
An organic salt of silver	The density giver.
Citric acid	The preservative.

Such may be immediately gathered on reading any of the many formulæ that have been and are still published for P.O.P. We have therefore to remember, when toning, fixing and washing the prints, that these four substances are present, and I consider that every amateur should be familiar with the chemistry of the process to this extent. Such knowledge applied to practice together with the information I now propose to give, would save much unsuccessful work, and the manufacturer many complaints. Almost all of these would be quite unnecessary were the user to remember with how delicate a thing he is dealing.

Action of Printing. If we trace what goes on in a piece of P.O.P. during its exposure under a negative, we find that first of all the silver chloride becomes reduced to a sub-chloride, or even to metallic silver on the actual surface of the film where any great density is attained. It is evident that the silver nitrate present is decomposed, and assists in supplying the metallic portion of the print, as if silver chloride alone were present, no bronzing of the "shadows" would be possible. That the organic salt of silver is reduced is obvious also, and doubtless, owing to the readiness with which it decomposes into the metal and bi-products, it is partially a kind of store from which the chloride derives a fresh supply of reducible matter.

Hence in toning a photograph, we may take it that we have got to gild, or cover with metal, a silver image, and that therefore we must use, beside the metal or metallic salt, an electrolyte. The two combined take the form of a soluble salt of gold, which is generally reduced from gold trichloride, $AuCl_3$, to gold monochloride, AuCl. In other words, ammonium sulphocyanide, sodium bicarbonate, borax or some other agent is necessary.

Proportioning the amount of this reagent to the quantity of gold chloride is one stumbling block in toning. As an example the standard sulphocyanide formula is A.

	A.	B.
Gold chloride	2 gr.	2 gr.
Amm. sulphocyanide	30 gr.	28 gr.
Water.....	16 oz.	12 to 15 oz.

In place of this I find B preferable.

If not quite neutral, *i.e.*, if at all acid, neutralize with a few drops of ammonia.

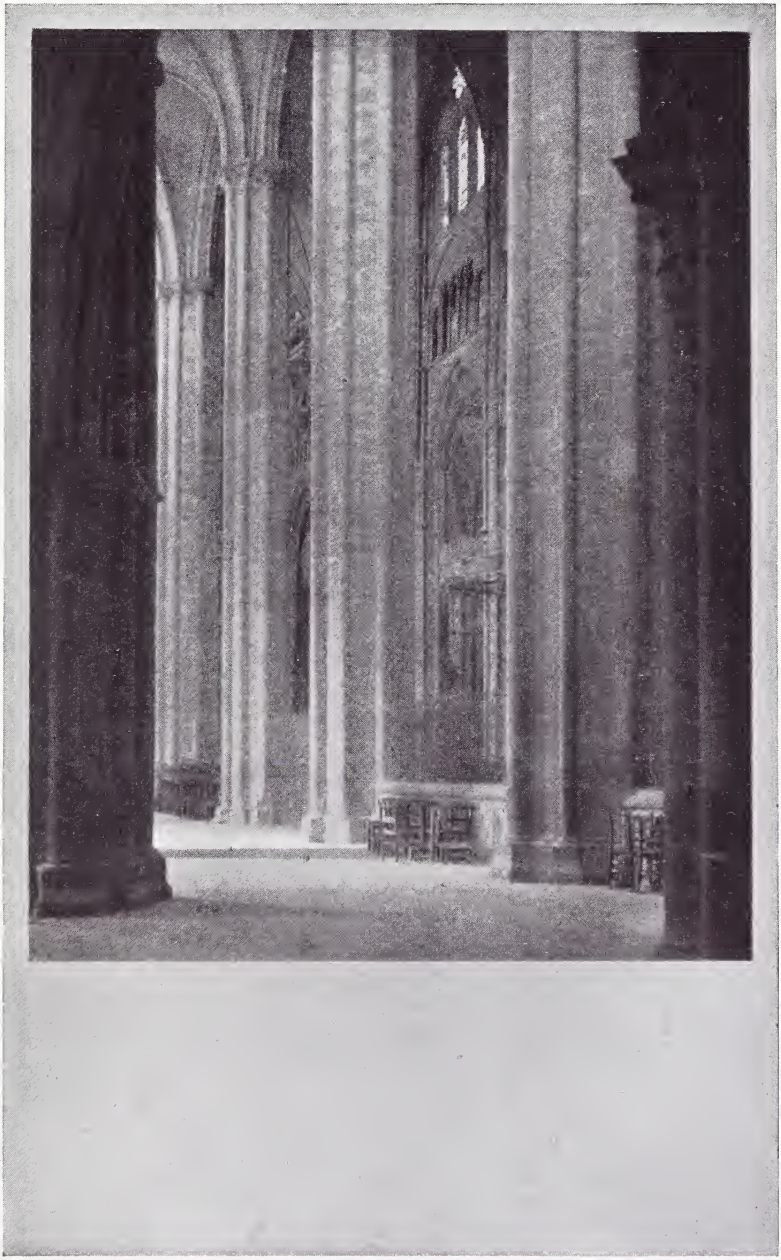
It is not wasteful to use a concentrated toning bath.

Preliminary Washing. It is the custom with some workers to tone P.O.P. in a sulphocyanide bath without previous washing. But that this is a radical mistake can readily be shown. In the film we have two soluble compounds, silver nitrate and citric acid. The toning bath contains a quantity of free solvent, viz., water. Each print that is placed in the bath discharges its salts, and thus by degrees the toning solution gets almost saturated with silver nitrate and citric acid. But a gold toning bath should essentially be neutral or slightly alkaline, and therefore the entrance of citric, or any other acid, is a thing to be avoided. Washing all the available silver nitrate out of the film is also important, otherwise some silver nitrate is added to the toning bath, and, as a result, some silver chloride is formed. This—when the bath is left in the light—becomes partially reduced. In this reduced state it suffers the deposition of gold upon it, and hence the toning solution is gradually robbed of its chief agent.

If we immerse a P.O.P. print in tap water, which contains chlorides and sulphates we get a cloudiness formed by the precipitation of silver chloride :—

$$\underset{\text{Free nitrate.}}{Ag\,NO_3} + \underset{\text{Metallic chloride.}}{M\,Cl} = \underset{\text{Silver chloride.}}{Ag\,Cl} + MNO_3.$$

Double Tones. These are sometimes due to an insufficient preliminary washing. In this case some portions of the picture are rid of more free nitrate than others. They are frequently due to the poverty of a toning bath, when the solution is too weak to tone the dense parts of the



In Bourges Cathedral.

picture as rapidly as the light ones ; but more often it is the fault of the paper itself, which is somewhat unevenly coated and, therefore, would require more gold deposition on the thickly-coated portions than on the thinly-coated parts. With the efficient machinery at the manufacturers' disposal nowadays little trouble should be caused by this shortcoming, and double toning generally means faulty baths.

The Combined Toning and Fixing Bath.

There is much to be said for and against this combination. The whole matter may be summed up as follows: If a combined bath contains citric acid or an acid salt, then inasmuch as acid and hypo liberate sulphur, it must be radically wrong; if the bath be neutral or alkaline, and the tendency to form sulphur be abolished, then there is much to be said in its favour, albeit it is still prone to produce many evils.

The formation of sulphur may be readily observed by adding to some hypo solution in a test tube a crystal of citric acid, and then gently heating it; a white curdy precipitate will gradually appear, or if only a small quantity of acid be present it will become milky, and the precipitate separate out more slowly.

Two sets of chemical reactions are suggested by D. Hoy to illustrate the formation of sulphur. Both are worthy of note.

(i.) [α] $Na_2S_2O_3 + 2HCl = 2NaCl + H_2S_2O_3$
[β] $H_2S_2O_3$. $= H_2O + SO_2 + S$

In this case hydrogen chloride might be any other acid, though it is stated that hydrochloric acid is formed in solution owing to the presence of the gold chloride.

(ii.) [α] $3Na_2S_2O_3 + Al_2(SO_4)_3 = 3Na_2SO_4 + Al_2(S_2O_3)_3$
[β] $Al_2(S_2O_3)_3 + 3H_2O = 3H_2S + Al_2(SO_4)_3$
[γ] $H_2S + Na_2S_2O_3 = NaHSO_3 + NaHS + S$.

This second set of reactions can, of course, take place only when alum is present; alum and hypo combine to form (some) aluminium thiosulphate, which is decomposed by water and hydrogen sulphide liberated. This in turn reacts with hypo to form an acid sulphide, and acid sulphite, and sulphur

itself. It is hardly necessary to observe that when sulphur is present in the film—and it is extremely difficult to remove—there is a great possibility of silver sulphide forming, which compound being of such a variety of "metallic" colours produces disastrous results.

Now, if we soak a sheet of paper with a gelatine film in some solution, so that it takes up a soluble salt, and then immerse the paper in plain water, it is merely a matter of time for that salt to dissolve out again completely from the film. But if the paper be soaked in a solution such that sulphur were deposited in an extremely fine state in the pores of the surface, it is readily understood that no amount of washing need necessarily remove it, sulphur being quite insoluble in water.

The combined bath to be adopted (if the separate methods of toning and fixing be not used) should contain no lead salt, such as the acetate or nitrate, but merely sulphocyanide, citric acid, hypo and gold. The addition of a small proportion of sodium tungstate will cause the tones to be redder in colour.

Great care must be taken when composing a combined bath so to arrange that the print may not be completely toned before it is completely fixed.

Fixing. The action of the fixing bath is to remove from the film everything except the toned image (which is practically a silver photograph plated with gold), and from a consideration of the earlier part of this article we know that there is in the film all the silver nitrate, citrate, tartrate and chloride which has not been used for the building up of the picture. Now, the nitrate and any free citric acid will have been dissolved either in the preliminary wash water or in the toning bath, and we have therefore now to remove any such substances as silver chloride, which are insoluble in water. Sodium thiosulphate, or "hypo," $Na_2S_2O_3$, will do this. A fifteen per cent. solution is the best strength to employ.

Permanence. This depends on three things. Prints will fade if

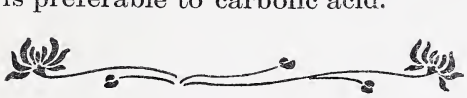
(i.) Any sulphur be present to form Ag_2S.

(ii.) Any sensitive salts be left in the film to go on discolouring in light after the print is finished.

(iii.) Any hypo be left in the film or pores of the paper.

The first condition has already been discussed. The second comes into force only when insufficient time is allowed for fixing (ten minutes should be sufficient, but the minimum), or the bath be over used. The third exists when insufficient washing is given. If the prints be rinsed in water, then suspended face downwards for twenty minutes in water, then again rinsed, they will be sufficiently washed; otherwise a minimum of ninety minutes in running water, or at least ten changes is advisable.

Mounting. There is, however, another danger, viz., mounting. When some mountants become stale they also become acid, and this causes yellow discoloration. To avoid this I recommend a mountant consisting of dextrine, water, a little sugar and some boracic acid, which has been previously dissolved in water. Boracic is preferable to carbolic acid.



To Prevent Prints Curling.—After final washing, immerse in water 4 parts, alcohol 2 parts, glycerine 1 part, and hang up to dry. To remove any surface stickiness, the surface may be wiped with a tuft of cotton wool moistened with alcohol.

Drying a Print Quickly.—First blot off all surface moisture with fluffless blotting paper, or a clean dry handkerchief. Then immerse the print in methylated spirit for not less than ten minutes. Hold up by one corner to dry. Then gently fan until surface dry. The print may now be held near a fire, and quickly waved to and fro.

Caution Regarding Damp.—In damp weather the gelatine coating of the paper being hygroscopic may easily stick to the negative film and cause irreparable damage to the negative besides the loss of the print. Therefore, care should be taken to keep the paper dry and to varnish the negative before printing.

Pictorial Pointers for P.O.P. Printers.

By WARD MUIR.

THE fact that a worker prints on matt-surface paper does not necessarily indicate that he is an artist; nor is a man necessarily non-pictorial because he uses P.O.P. Art is no more an affair of materials than technique is of text books.

The "tone" of a P.O.P. print ought largely to be determined by the subject. Thus a warm brown is apt to strike an incongruous note when the photograph is that of a snow scene. To aim at getting every one of a batch of prints from different negatives toned to precisely the same tint is a mistake of taste. Even from the point of view of avoiding monotony, sameness of tint is undesirable. The truly skilled worker shows his power over his materials rather by the variety of the tones he obtains, than by the similarity. He gets the tone which is "just right" for each separate picture; and the judging of what is "just right" exercises his artistic instincts as much as the selection of the original subject itself, but in a different line.

That the colour and quality of the negative has much influence on the tone of the P.O.P. print is a well-known fact; and the worker who purposes printing in silver ought to bear this in mind when selecting his developer. No amount of care will give a truly soft print from a harsh, strong-contrast, yellow-stained negative. Remembering this, a hard negative will be avoided when aiming to produce a soft delicate rendering of a soft and delicate scene.

When a print on glossy paper has turned out too light, it may be helped a little by matt-surfacing it on ground glass, or a matt pulp slab. The defect will then not show so markedly.

A PORTRAIT. M. Greuze.

The selection of tinted mounts for P.O.P. prints may without exaggeration be said to offer greater difficulties than for prints in any other photographic process. The colour of the average P.O.P. print is unlike that of all ordinary monochrome pictorial processes, so we have no old-established rules to go upon. The most difficult tone to mount artistically is the "photographic purple." This does not go well with the (otherwise nearly always safe) brown paper mounts, and very frequently strikes a clashing note with green. Occasionally a light grey suits it, but more often the worker's only refuge is a cream or even a white. In this case it need hardly be said that any deterioration of the high-lights shows up with painful distinctness. Broadly speaking, therefore, it may be laid down that "photographic purple" is the least satisfactory of the tones obtainable on P.O.P. This is not merely because of its awkardness in mounting, but also because of its general unsuitability to most pictorial subjects.

The redder tones are easier to deal with. There will rarely be much difficulty in selecting a green mount to go with a warm-coloured print. With very red prints, grey mounts may also be tried with pleasing results. "Photographic brown" prints are less safe again; but a green tint can generally be found amongst one's mounting papers which will not kill them. They will very seldom bear a brown mount.

Platinum-toned black prints are the easiest P.O.P's to deal with as far as mounting is concerned. Although the range of tinted mounts which go well with them is hardly so extensive as that of ordinary platinotypes, it is nearly so. Greens, browns, and greys may all be experimented with; not to mention the more daring blues and reds. The peculiar rich quality of the platinum-toned image shows at its best on rather ultra-simple mounts. Indeed, in mounting all P.O.P. prints, any touch of ornateness should be avoided with even greater care than when mounting, say, platinotypes or gum prints, as the artistic effect of P.O.P. is already sufficiently endangered by its extreme detail-giving nature.

Miscellaneous Hints.
A Chapter for Beginners.

By THE EDITOR.

LET not the beginner be dismayed by seeing this long and formidable list of possible failures. Let him not think that he is at all likely to encounter all, or indeed any of them. Still it *may* happen that any one of the troubles will some day add an experience, then glad indeed will he be to have on the reference shelf his friendly guide, for it not seldom happens that the simplest causes are those that we think of "last of all or not at all." To quote just one instance, *viz.*, the appearance of yellow spots and stains while the prints are washing after toning and before fixing. The beginner is not likely to suspect that a *dilute* splash of hypo at this stage may cause a stain, when a strong bath of the same thing is about to serve as his best friend.

The print is not quite sharp, and also reversed as regards right and left.—If the negative be a "film," probably the explanation is that the negative was in the printing frame "wrong way round." The rule in printing is to put the paper next the film side of the negative.

Uneven Printing.—(1) May be due to part of the paper being damp. (2) The printing pad being damp in parts. The damp portions showing a slight yellower colour than the drier portions.

Double Outlines result from shifting the paper when the printing frame is open for examination of the print.

Fuzzy Print from Sharp Negative.—The paper is not in even contact with the negative. Between the paper and printing frame back put several sheets of clean dry blotting paper.

Degraded High-Lights.—Exposing the paper to strong light while examining the print in the printing frame.

General Fog over the Print.—(1) Exposure to light before or after printing. (2) Stale paper. (3) Paper kept in impure atmosphere.

Dark Spots.—Parts which have been toned but not fixed by reason of air-bells clinging to the surface of the paper in the fixing bath. Examine the negative to see if there are any thin places or clear pinholes in the film.

Prints do not change colour in Toning Bath.—(1) Gold has been omitted. (2) Gold is exhausted. (3) Presence of small quantity of hypo or some acid. (4) Temperature too low.

Prints turn Yellow after washing and on exposure to Light.—(1) They have not been thoroughly fixed. (2) They have not been thoroughly washed.

White Spots on the Print usually suggest dark spots, dust, etc., on the negative—or bits of paper, hairs, etc., between the paper and negative. In the case of a developed print an air bell clinging to the paper during development will yield a sharp-edged light spot.

Pink High-Lights, or Vignettes.—Usually the result of trying to tone with a bath practically exhausted of gold. May be due to exposing prints to too strong light during the first washing, toning or fixing. Daylight does no harm after the prints are thoroughly fixed.

Degraded High-Lights with Platinum Toning.—Neglect to use salt bath before toning, or omitting alkaline bath after toning and before fixing.

Dull Spots on Glazed Print.—Air-bells imprisoned between glass and print.

Sparkling Spots on Matted Prints.—Air-bells between the ground glass and print.

Double Toning.—(1) Toning too long. (2) Not toning long enough (see changes of colour in gold toning). In the latter case the print may be fixed, well washed and toning resumed.

Dusty or Grey Bloom on Prints.—(1) Excess of gold in the bath. (2) Over-toning. (3) Not getting rid of the silver chloride in the first washing water soon enough.

Prints are too Black and White, lacking Detail in High-Lights.—(1) Negative too strong in contrast. (2) Negative pyro (or otherwise) stained. (3) Printing in light not strong enough. (4) Over-printing. (5) Over-toning. (6) Toning slowly in acid bath.

Yellowness of Prints.—May be due to not fixing long enough, or using the same fixing bath a second time. (Ten minutes in a bath of 3 oz. hypo per pint of water at 65° F. is a good standard guide).

Weakening of the Prints may be the result of using the fixing bath too strong or for too long a time, or the use of an acid gold bath.

Red Spots.—Parts untoned, the result of touching with greasy fingers; or the result of tiny drops of saliva falling on the paper when the paper has been blown upon at some time.

Black Spots.—(1) Fine particles of iron in the paper. (2) Particles of iron rust brought down the water supply pipe from cistern, etc. (3) Particles of sulphur from rubber tubing. (2 and 3 usually recognised by comet-like appearance of spots). In 2 or 3 filter the water through several thicknesses of fine flannel tied over the tap mouth and use a handful of salt in the first gallon of washing water. (4) Dry pyro particles floating in the air.

Yellow or Brown Stains.—Small quantity of hypo, *e.g.*, a splash from a fixing bath or touching with fingers contaminated with hypo. Using for a toning bath a vessel which has been contaminated with hypo. Laying print on table where there is fine hypo dust, etc., etc.

Grease Spots, Finger Marks.—To remove these apply with a tuft of cotton wool a little pure benzole, and dry off with fluffless blotting paper. Or if the print be small it may be immersed in a bath of benzole.

Uneven Toning.—(1) Uneven washing; prints sticking together in the washing bath. (2) The result of uneven printing, *q.v.* (3) Too many prints in the bath at one time or not enough toning bath in the dish. Prints sticking together in the toning bath.

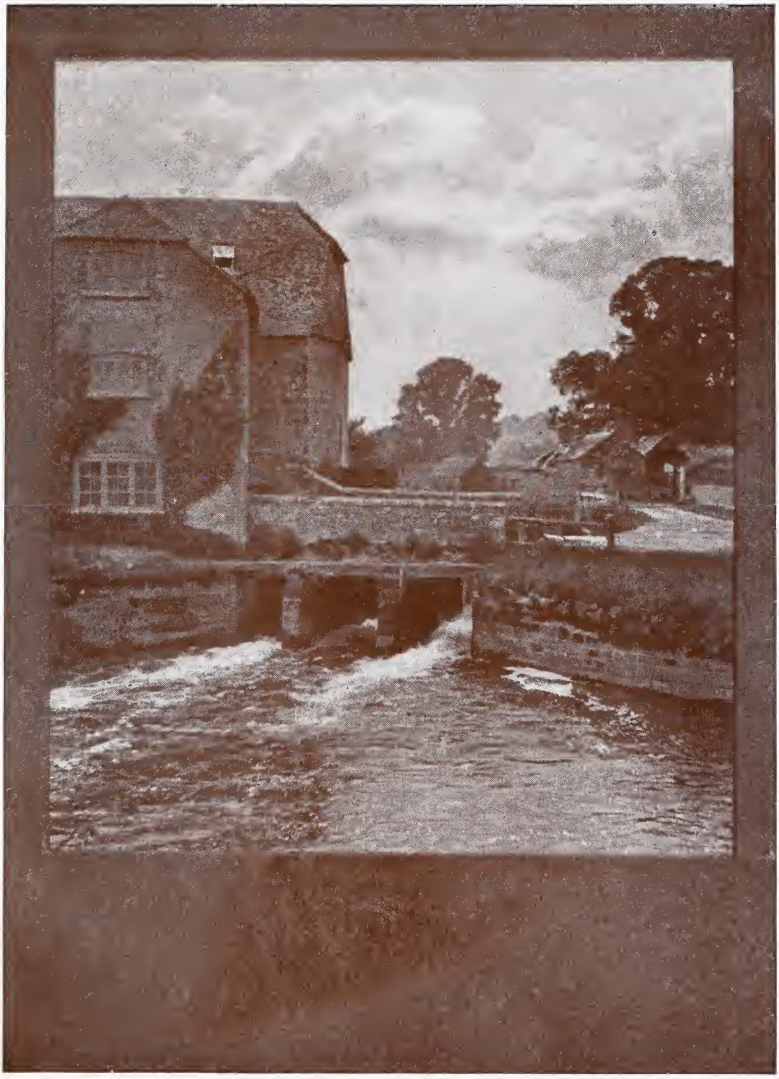


Fig. 10. S. E. Fincham

FITTLEWORTH OLD MILL.

SILVER MEDAL. ENLARGING COMPETITION.

The picture is weak and flat, lacking in brightness and contrast.—The negative may be too weak, flat, and lacking in contrast, the result of a dull light, over-exposure, under-development, or the print may have been weakened by over-toning, or an acid toning (gold) bath, or prolonged exposure to the air while wet with fixing bath solution.

The gelatine of the print becomes soft and dissolves.—Perhaps due to too high temperature (in warm weather use the alum or formalin bath) or the toning bath is too strong in ammonium sulphocyanide.

The Print Sticks to the Glass.—This may arise from damp or a damp negative. The practice of blowing upon the paper to raise it up for inspection should be rigorously avoided. Tiny drops of saliva are carried to the paper or negative and may irretrievably ruin the latter. The paper should be kept in a dry place. If the negative has not been properly washed or has been left in a damp atmosphere it will absorb moisture from the air. Printing in the open air in damp weather may bring trouble in this direction. If the paper has stuck to the negative the best thing to do is to tear away as much paper as one can without injuring the negative, and then immerse the negative in a clear fixing bath at once. The paper will soften and may be rubbed away by the finger tip or a tuft of cotton wool. The negative should be again well washed.

Varnishing the Negative is a very desirable precaution against most of the troubles arising from dampness.

The Pink or Mauve Tint of the Paper is destroyed.—Probably due to use of soda carbonate in the first washing, or sulphite in the toning bath, or an impure hypo for fixing.

The Tone-Colour is considerably changed by the Fixing Bath.—(1) Toning has been too rapid (bath too warm or strong in gold). (2) First washing has not been thoroughly performed. (3) An acid fixing bath. (4) Print left too long in fixing bath. (5) The hypo-wet print has been exposed to the air for some considerable time.

Yellowness of Prints.—Due to lack of changing first washing water soon enough. The first washing contains free silver, which if not quickly got rid of readily combines with the gelatine and fibres of the paper.

Stains.—Brown Stains may sometimes be removed by the local application of alum, 1 oz.; water, 20 oz. Soak the print in water until quite limp. Lay on a sheet of glass. Blot off surface moisture. Apply the solution locally by means of a tuft of cotton wool.

Yellowness due to age or faulty storage. Try a 5-grain per oz. solution of ammonium persulphate.

Brown-yellow Stains appear during washing after toning and before fixing.—Due to presence of a *small* quantity of hypo.

Stains appear in the Fixing Bath.—The result of an acid fixing bath, or acid prints put into fixing bath.

Prints show Yellow-brown Stains during washing after fixing.—(1) Imperfect fixing. (2) Too weak fixing bath. (3) Prints sticking together in fixing bath. (4) Using stale or exhausted fixing bath.

The prints are flat and weak and "washed out."—(1) The result of a negative not strong enough in contrast. (2) Insufficient printing. (3) Leaving prints in fixing bath too long. (4) Prints floating in fixing bath and exposed to the air while saturated with the fixing solution. (5) Printing in too strong light (see use of coloured glasses during printing). (6) Use of toning bath in acid condition due to imperfect washing of the print.

Blisters.—Passing a print from one liquid into another at a higher or lower temperature. Such changes of temperature should be carefully avoided. Dissolving hypo in water considerably cools the water. Therefore, when making a fixing bath either use warm water or make the bath some hours before required so that the solution may have time to reach normal temperature again. Blisters may be caused by creasing or cracking the paper.

Vignetting.—This may most conveniently be done by means of cards in the following way. Take any bit of stout card, such as the lid of a plate box, and cut it to the same size as the outside edge of the face of the printing frame to be used. For a quarter-plate size negative, this will probably be about $6\frac{1}{2} \times 5\frac{1}{2}$ inches. Now sketch on this card the position of the head and shoulders of the figure or other object to be vignetted. See Fig. 21. Cut out the portion. Lay the card on the printing frame containing the negative, and see that the opening corresponds in size and position with the part to be vignetted. Then along this opening cut out a series of teeth or serrations in the card, see Fig. 22. In general these teeth may be about $\frac{1}{2}$ inch long (A), but if extra soft edges are required they should be somewhat closer and longer (B). This card is laid on the printing frame and that is from $\frac{1}{2}$ to 1 inch away from the negative. To keep the card in position on the frame a couple of tacks or drawing pins will serve. The frame is now put out to print in the usual way, but at frequent intervals it is turned a quarter way round so that the light may fall on the negative and vignette in various ways. If printing in direct sun, it is advisable to cover the face of the card opening with a sheet of tissue paper.

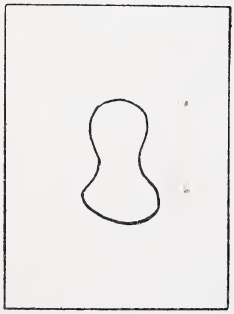


Fig. 21.

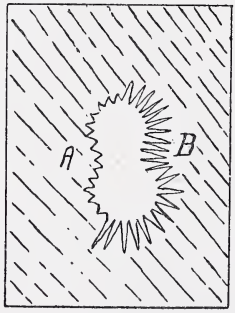


Fig. 22.

In place of card, a piece of thin sheet lead may be used. By bending outwards the teeth of the card or lead we may totally soften the vignetting effect. Specially prepared coloured glass with clear centres gradually shading off to a deep orange are articles of commerce.

Combined Toning and Fixing.—In general this procedure is not to be recommended. But when a few prints are wanted quickly for a purpose where their permanency is of secondary importance, the method may be useful. Two difficulties arise. First, as we cannot see when a print is fixed, it may tone quickly and be removed from the bath before it is fixed. Secondly, before all the gold in the bath is used up probably sulphur has begun to be deposited, so that the result is, in part, sulphur toning. Prints prepared by the combined bath have been known to retain their pristine appearance for years. Various formulæ from very reliable authorities are given on page 62.

Fixing.—The temperature of the fixing bath should not be much below 60°F. nor above 70°F. Two ounces of hypo are reckoned to be sufficient (in 15 oz. water) to fix 8 whole-plates or 32 quarter-plate prints. It is advisable to add liquid ammonia a little at a time until, after stirring, the solution just smells of ammonia. Time of fixing generally advised is from 10 to 15 minutes. At the end of 12 minutes it is advisable to turn on the tap and let a gentle stream of water flow into the dish of prints fixing—and with one hand keep all the prints gently moving. This gradually dilutes the solution and greatly reduces any chance of blistering which may result if a print be transferred from a hypo solution straight into plain water. After the dish is full of diluted fixing bath, it may be poured off and filled up with plain water.

Washing.—The quicker the hypo is now got rid of the better. The following is a good plan. Lay each print one at a time on a sheet of clean glass or slab of vulcanite, and gently pass over it a roller squeegee. Remove and drop it into a dish of clean water. When all are thus treated, then begin again, *da capo*. If this be repeated half a dozen times the prints will probably be practically free of hypo. We have it on excellent authority that if a print be held under a gently flowing tap and frequently turned over for ten minutes that it is hypo free, or that half a dozen soakings of 5 minutes each in fresh water secures the same end. Nothing is gained by prolonged soaking.

Fig. II. Mrs. H. Morgan.

MY LITTLE SON.

PRINT CRITICISM AWARD.

Glazing Methods.—For this purpose we may use glass, ferrotype plates, vulcanite or celluloid. Whatever is used must be thoroughly clean and also well polished. Soap and water will clean any of the above substances, but for old glass negatives a few minutes' soaking in a mixture of nitric acid 1 part, water 20 parts, may be recommended after the soap-and-water treatment. Common consent makes glass the favourite.

Polishing the Plates.—We have a choice of any of the following mixtures:—

1. Powdered French chalk (talc); 2. Spermaceti wax 1 part, benzole 20 parts; 3. Soap liniment; 4. Beeswax dissolved in turpentine to the consistency of thin cream; 5. Paraffin oil; 6. Vaseline.

Whichever of these lubricants be used, do not make the common mistake of using too much. One or two drops should be enough to cover a whole-plate sized glass. The polishing should be done with a *linen* cloth.

Soak the print in cold water. Bring the face of the print and the polished surface of the glass, vulcanite, etc., together under water, taking every care to avoid enclosing any air-bells between the print and plate—withdraw and lightly squeegee—surface dry the back of the print with blotting paper and set up to dry.

Note that by employing glass or clear celluloid we can see whether we have enclosed any air-bells between the glass and print.

Failures may arise from various causes:—

1. The plate was not thoroughly cleaned; 2. It was not sufficiently polished; 3. The print should be hardened either by formalin, alum or some other bath, see page 60; 4. It is greatly conducive to success (though not essential) to dry the print after final washing and again to wet it before laying on the polished plate.

Remedy.—Should a valued print refuse to leave the glass. First make sure that it is thoroughly dry by keeping in a warm place for some hours, *e.g.*, kitchen mantelshelf; 2. On no account use force; 3. Apply to the back of the print a mixture of formalin 1 part, water 15 parts, and again dry thoroughly.

Repeat with a further lot of emery (and patience). The finer the emery the slower the grinding, but the better the effect. Hence the above process of separating the fine particles from the larger ones which quickly sink to the bottom of the tumblers.

Enamelling.—This procedure is often confused with glazing. For enamelling we require a sheet of glass free from scratches. This is thoroughly cleaned and talc polished; then coated with plain or "enamel" collodion. As soon as this is set, the plate is washed in cold water until the greasy appearance has gone. The plate is then put into a dish of tepid water (70°F) and the print immersed in the same. They are brought together under water and removed and treated exactly in the same way described under glazing. When the print leaves the glass it has now a collodion surface.

Another way consists in making a one in ten solution of gelatine. Immersing the (previously thoroughly dried) collodionised plate, and (previously hardened) print in the gelatine solution at 70-75°F. Then bring the print and collodion surface together, avoiding air bells. Withdraw, and very lightly squeegee with roller. Wipe away superfluous gelatine solution with warm damp sponge.

Yet another way is to level the collodionised plate and pour on it a pool of gelatine solution, and lay the print softened in plain water on the pool of gelatine.

Burnishing.—P.O.P. prints may be highly glazed by means of a hot burnisher, used in the manner familiar to the users of the older albumen papers. The print *must* be thoroughly dry. Burnishing polish may be made by mixing 1 part of castile soap, cut or scraped to fine shreds, with 2 parts water, and then slowly adding 18 parts of methylated spirit. The whole should then be squeezed through fine canvas. A few drops of this mixture are rubbed over the face of the print by means of a bit of rag or flannel. The bar of the burnisher must be smooth polished with the finest emery and then oil and leather. It is used just about as hot as can be borne when grasped in the hand.

Hypo Eliminators have been proposed, tried and rejected for one reason or another. Experts are agreed that the best hypo eliminator is a *gentle* stream of water.

Testing for the Presence of Hypo.—If in doubt, it is as well to apply the following simple test for the presence of hypo.

Stock Solution.—Potassium permanganate ..... 2 gr.
Potassium carbonate (*or* hydrate) ..... 20 gr.
Water..... 1 oz.

In a white teacup put about a tablespoonful of water, then add drop by drop of the test solution, just enough to give the water a pale pink colour. Take two or three prints from the water in which they have been for three or four minutes, and let the drippings from them fall into the pink solution. If the colour is discharged further washing is necessary. If the colour is changed to a pale yellow, but little hypo remains. If no change of colour takes place beyond that due to the addition of more water then hypo is absent.

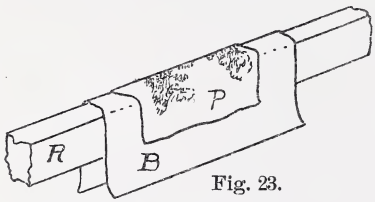


Fig. 23.

Drying Prints.—Gelatine prints must not be dried between blotting paper. If laid flat they tend to curl considerably. The following method will be found convenient. Along the rails of an ordinary clothes-horse, R, Fig. 23, lay strips of blotting paper, B, so creased that they fit the wooden rail well, and have two sides hanging down fairly straight and vertical. If now the prints be taken from the wash water, and one by one laid *face downwards for a moment only* on "robosal" (*i.e.*, fluffless) blotting paper, and then laid back down on another sheet of blotting paper, and finally laid back down on the strips of blotting paper, as shown in Fig. 23, the prints will dry moderately flat. At any rate their general curvature will be outwards rather than inwards.

Special toning for glazing.—By using the formalin and gold toning bath the print is hardened and toned in one operation. (Bath 24, p. 61).

Quick Glazing. — Take a print from the wash water. Shake off all surface moisture. Place it in methylated spirit for five minutes. Remove and squeegee on to polished ferrotype or glass. Dry the back of print with blotting paper and fan vigorously in a warm place. (The print should of course have previously been hardened). When quite dry the print will probably fall off the plate.

Matting P.O.P.—Thoroughly clean with soap and water a sheet of finest ground glass. Dry and then polish with a dust of French chalk (talc). Soak the print in water and lay on the ground glass. Cover the back of print with waterproof paper and pass over it a roller squeegee. Do not use much force. Set up to dry when the print will leave the glass if one corner be raised.

In place of ground glass we may employ a sheet of matted celluloid such as is used for focussing screens.

Stiffening Prints. — When the print has been squeegeed down to the plate, dry its back and paste down to it a sheet of stout note paper exactly the same size as the print. Allow ample time for drying. A print backed in this way may then be used as a post-card, etc.

Making ground glass for matting prints.—Procure some fine ground emery powder. Mix up half a teaspoonful in a tumbler of water. Stir well and remove the stirring spoon. Wait $\frac{1}{4}$ minute and pour off the muddy water into a second tumbler. Throw away the sediment in No. 1. Fill up No. 2 with water. Stir again and in $\frac{1}{4}$ minute pour back into No. 1 tumbler. Set aside for the particles to settle. Then gently pour off as much water as you can.

Lay the sheet of glass on a *flat* board. Take out as much of the fine emery mud as you can lift with the point of a pocket knife. Lay this on the glass. Then with a flat glass paper weight rub the mud all over the glass, using a continuous circular stroke. Wash off and examine from time to time.

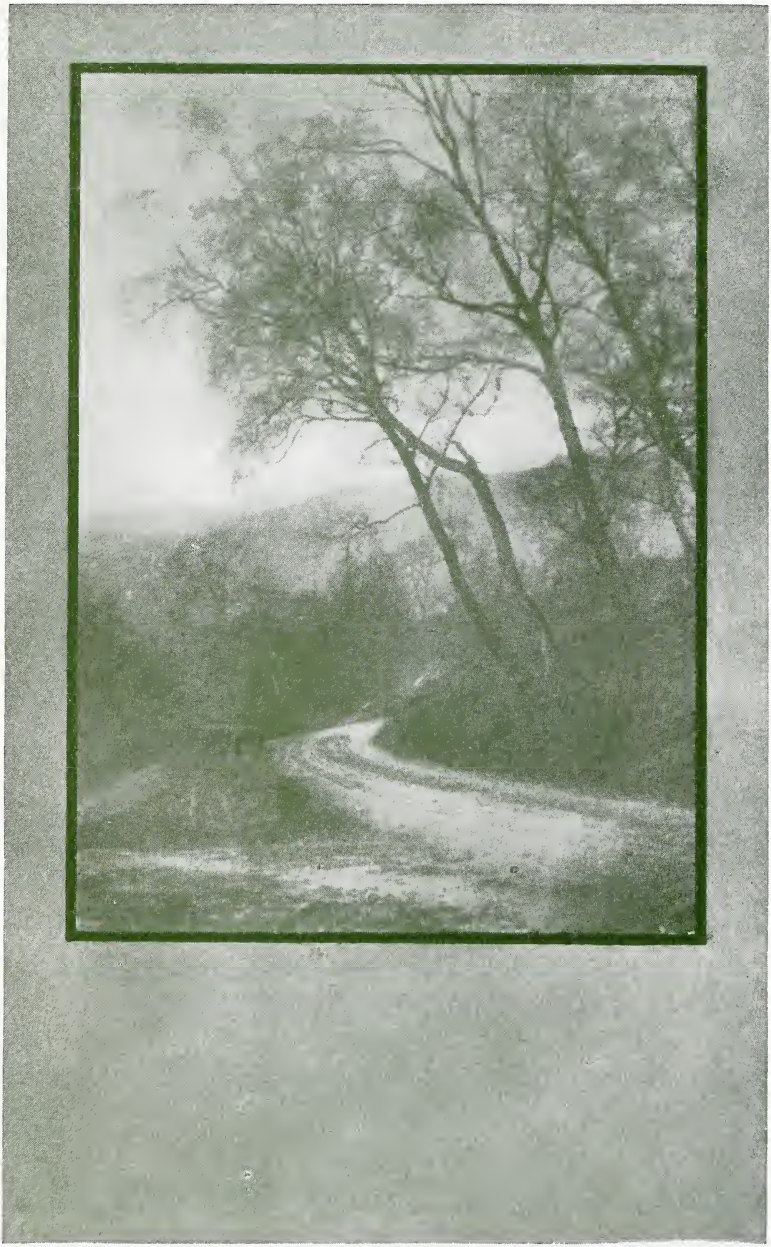


Fig. 12. NEAR LLANGOLLEN. Miss Walker.

PRINT CRITICISM AWARD.

Fig. 13. B. B. M. Olivena.

EVENING REFLECTIONS.

BRONZE MEDAL. ENLARGING COMPETITION.

Transferring P.O.P. Prints to Glass, Opal, etc.—Place 20 grains of gelatine in an ounce of cold water until the gelatine is quite soft. Then put the containing vessel in a dish of hot water when the gelatine will dissolve. Now add enough of a saturated solution of potassium bichromate to render the mixture a pale yellow colour. With this coat one side of the sheet of glass (previously thoroughly well cleaned) as if varnishing a negative. When the solution has set place the plates in a dark place until dry. Then expose to daylight for two or three hours. Having trimmed the P.O.P. print, wash, tone, fix and wash in the usual way and then harden in a formalin bath 1 part commercial solution, water 20 parts and again wash. Take now the glass plate and soak in several changes of water until the yellow colour is discharged. Then bring the print face down on to the gelatine-coated glass face up, both being under water and withdraw them in that relative position, being careful to avoid air bubbles between the print and glass. Lay the glass on a sheet of blotting paper. Place two or three sheets of blotting paper on the back of the print and lay a flat board and weight on the top. At intervals change the blotting papers. In about $\frac{1}{2}$ or $\frac{3}{4}$ hour the print will feel nearly dry. Now let a gentle stream of hot water (150—180°*F*) flow from the tap on to the back of the paper. Presently (in 10 minutes or so) the paper will be loose enough to peel off in the manner one strips away the backing paper in the carbon process. As soon as the paper is removed the picture is placed in warm and then cold water and finally set up to dry.

For transparencies on opal the prints must be somewhat lightly printed. But for mounting on clear glass or ground glass the printing should be rather more vigorous.

Special Uses of Glossy P.O.P. Prints.—A print of this kind is especially characterised by its power of recording the fine detail of the negative. Hence such a print suitably toned may be used for the purpose of making an enlarged negative, or for the making of a half-tone block for illustration purposes.

Use of Coloured Glasses.—If the face of the printing frame be covered with a piece of flashed chromium glass the printing time will be prolonged, and the contrasts of light and shade considerably emphasised. Strong prints may thus be obtained from weak contrast negatives. Similarly by the use of blue or violet glass we may reduce contrasts and obtain from a strong contrast negative softer prints than would be obtained in the usual way.

Quick and Slow Printing.—Quick printing generally means printing in strong sunlight. This tends to reduce the printing contrasts of the negative and so to obliterate delicate gradations, detail in the shadows, etc. Slow printing, *i.e.*, in the shade or under ground glass, on the contrary, tends to accentuate contrasts. Hence thin, and flat negatives will give the best result by printing in a room away from a window and taking, perhaps, two days to print.

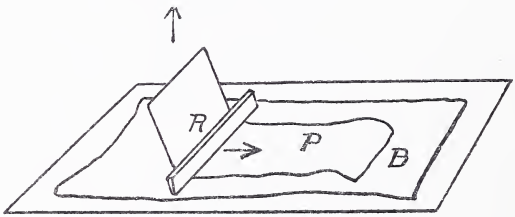


Fig. 24.

Flattening curled prints.—On any flat surface which will bear pressure, such, for instance, as a drawing board, lay two or three stout sheets of clean dry blotting paper, B, Fig. 24. Lay the curly P print face down on the blotting paper. In the right hand take a straight thin flat ruler, R, and hold it with the narrow edge downwards. Bring this edge across the back of the print at about its centre. In the left hand seize the left-hand end of the print and raise it as shown in Fig. 24. Now with a steady, fairly strong, but quite even, pressure slide the ruler parallel to its first position along the back of the print in the direction shown by the arrow towards P, and, at the same time, gently pull upwards the left-hand end of the print in the direction shown by the arrow above that end. Then reverse the print and repeat the process.

Collodio-Chloride Papers.

By W. W. WILLIAMSON.

NO serious difficulty will be experienced in working collodion paper by one who has had a little previous experience with the gelatine print-out papers. At the same time, when passing from one group of papers to the other it is as well to bear in mind certain little points of difference and interest.

Storing.—The paper should be kept flat, *i.e.*, under a weight (*e.g.*, a large book) in a cool and dry place. Very old paper may become brittle, when the surface cracks very easily if bent.

Printing.—On opening the package one may often detect a varnish-like odour. This is quite regular, and does not indicate any defect. The surface may be glossy or matt. In either case the sensitive side is that which is slightly concave. This may be the more easily noticed at the edges of the sheet. The sensitive side goes next the film of the negative. When opening the package or filling the printing frames keep in a subdued light, avoiding needless exposure to daylight of any kind. Handle the paper by the edges only. Touching the sensitive side with the fingers may lead to stains. Print until the picture looks rather darker than you wish the finished result to be. As soon as printing is complete remove the print from the frame, and put it away in a cool, dry, dark place. Proceed to tone as soon as possible after printing, *i.e.*, do not delay more than twenty-four hours, if possible.

First Washing.—Put the prints one by one into a large dish of water. Be careful that they do not adhere to each other. Keep turning them over and over. As soon as all the prints are wet remove them one by one to a second dish of clean water and so on, giving them a short soaking in four or five lots of clean water; or use a large dish into which is flowing a steady stream of water. Wash evenly, quickly, thoroughly, and avoid splashings and air-bubbles.

Alum Bath.—Next pass the prints one by one into a bath of water 1 quart, alum 3 to 4 ounces. Turn them over and over in this bath for five or six minutes.

Second Washing.—Washing after the alum bath should be done just like the first washing—for not less than 10 minutes, and 15 minutes will be better still.

Toning.—Each manufacturer gives a toning bath for his paper. A selection of standard formulæ may be found at the end of this volume (page 63).

With matt surface papers some workers tone briefly in a gold bath, wash, and again tone in a platinum bath.

Third Washing.—After toning again comes washing, and in the case of acid baths an alkaline bath (see page 63) is desirable to prevent the print carrying acid into the next (*i.e.*, hypo) bath.

Fixing.—The fixing bath is a simple solution of hypo and water (water 20 ozs., hypo 3 ozs.). The prints should be turned over one by one at least twice, and be in this bath from 10 to 12 minutes.

Final Washing.—Wash in several changes or in running water for not less than an hour.

Drying.—The prints may be surface-dried by pressing between sheets of clean blotting paper. They *may* be left between blotting papers, though this is not desirable, as impure blotting paper may produce spots or stains. They may be dried by being held before a fire. The best plan is to allow them to dry by pinning a corner to a shelf or clipping to a string.

Combined Toning and Fixing Baths may be used, but are seldom desirable.

Burnishing.—Note that, as alcohol is a component of collodion, this must not be used at any stage—*i.e.*, to assist drying or as a solvent for burnishing solutions. Burnishing is usually done by first polishing with a dry flannel that has been rubbed on a solid piece of castile soap, and then passing through a burnisher as hot as the hand will bear.

Glazing.—It is *not* desirable to attempt glazing by simply wetting and squeegeeing to glass. When a high gloss is required a glass plate should be cleaned, dry polished with French chalk, coated with

PLAYMATES.

J. R. H. Oldham.

collodion, and the print previously soaked in gelatine solution applied to the dry collodion on the glass. (See note on enamelling, pages 41, 42).

General Hints.—The deepest shadows may be slightly bronzed on leaving the printing frame. The various baths and washing waters should not be colder than 65°F. When the combined toning and fixing bath is used the prints are put into this bath without any previous washing.

For Warm Red Colours immerse in salt bath. (Table salt 1 oz., water 1 pint.)

For Sepia Tones bath in water 1 pint, liquid ammonia 2 drms., just before toning.

For Blue Tones reduce the acid in bath No. 5 from 3 ozs. to 1 oz. (page 63).

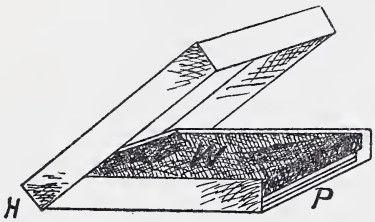


Fig. 25.

A convenient box for holding paper may readily be made from an empty plate box. First remove one edge, P, Fig. 25, of the smaller half or box proper. Then with tape and secotine or glue hinge the lid half to the box by the edge indicated at H. Now wrap up in the strong brown paper half-a-dozen old negatives. These are to form a paper weight. Cut a strip of orange paper to just double the size of a piece of printing paper. This folded in half holds a pile of cut papers. We see such a pile at P, held out flat by W, the glass weight.

It must be clearly understood that this is not a box to store paper in for any length of time, but is exceedingly convenient for holding just as many sheets and prints as one is about to use at one bout of printing, and is vastly more convenient than constant unwrapping and wrapping up the papers in the makers' envelopes.

Self-Toning Papers.

By W. W. WILLIAMSON.

BY this term is meant a group of papers which (presumably) contain gold in some form in their coated surface; hence gold is not required by the user. The print is made in the usual way and then immersed in, say, hypo and water, when toning and fixing go on simultaneously.

We here give a rough outline of the general procedure with such papers. But the worker must only regard this as an introduction to the subject, which is to be followed by a careful reading of the paper-maker's leaflet of instructions, so that any special point may be noticed.

Printing.—Most makers advise printing to be carried on until the print looks a full shade darker and stronger than it should when finished—*e.g.*, "considerably deeper" (Seltona), "print as for P.O.P." (Ilford Kalona), "rather deeper" (Luxia), "slightly deeper" (Kodak), "print exactly as P.O.P." (Imperial), "print as for the ordinary P.O.P." (Barnet), "print a little deeper than the finished print is required" (Paget), etc.

The following may be taken as a somewhat comprehensive general outline after printing fully, but not excessively:—

First Bath.—For warm tones put the print in a bath of water 20 ozs., alum 1 oz.

For cold tones use water 20 ozs., common (table) salt 1 oz.

The two above baths may be blended for intermediate tones.

Other first baths are as follows:—

1. Alum, 1½ oz., am. sulphocyanide, 20 grs.; water, 20 ozs.
2. Chrome alum, 40 grs.; table salt, 1 oz.; am. sulphocyanide, 40 grs.; water, 20 ozs.
3. Phosphate of soda, 50 grs.; water, 20 ozs.

Some makers advise washing in water only; others pass the dry print at once to the fixing bath.

Fixing.—If the print has been in any "first bath," it should be washed for five minutes before going into the fixing bath.

The fixing bath usually recommended is made by dissolving 3 oz. hypo in a pint of water. Fixing takes from 10 to 15 minutes. A fresh bath must be used for each lot of prints. After fixing, the print must be washed in the usual way, *i.e.*, either in gently flowing water for, say, one hour, or in six changes of 10 minutes each bath. The prints must not stick together at any stage of the procedure, and should be kept moving all the time to insure even action.

Drying.—Instructions vary also on this point. Some say that the print must be dried face upwards on blotting boards. Others permit it to be dried before a fire.

Glazing.—The print may be glazed in the usual way by squeegeeing to glass, etc. (pages 20, 41).

The colour depends upon the depth of printing, the composition and time in the first bath, and the time in the fixing bath. Prolonged fixing has a tendency to yield browns rather than reds.

Reducing Over-printed Proofs.—Reducing a P.O.P. print is seldom as satisfactory as making a fresh print. But in case of a broken negative or urgent demand, the reducers given on page 60 are useful. To ensure even action, the prints should be first well soaked in cold water, and also well washed after reduction. Unless the formula contains hypo, it is of great importance that the print has been thoroughly washed after fixing before being put in the reducing bath.

Cloud Printing.—As we can closely watch the process of printing with papers of the colour dealt with in this volume, the worker who has read pages 53-54 in *The Practical Photographer*, No. 1 (Bromide Printing) will not have the slightest difficulty. Indeed it is quite desirable to make a few P.O.P. cloud printing experiments before attempting cloud printing on bromide paper.

A Chat with J. Hort Player about Developing P.O.P.

By THE EDITOR.

OST gladly do I place on record my great indebtedness to Mr. Player (the well-known inventor of the copying process which bears his name) for his great kindness in placing at my disposal his experimental results in connection with this fascinating subject. The following notes are of special interest:— (1) Exposure of the print to daylight (in January) may vary from 30 seconds to 15 minutes. (2) Not been able to obtain reds or browns with amidol as a developer. (3) The best results are obtained with quinol. (4) Metol gives results comparable with those obtained by quinol. (5) Short exposure of the print, followed by strong, brisk development with quinol gives greenish-grey results. (6) The same exposure with weak developer and prolonged time gives reddish-brown results.

Mr. Player's procedure is to immerse the print without previous washing in a 6 gr. per oz. solution of potassium iodide for not less than half a minute, but the print may be in this bath 2 minutes. It is then washed in several changes of water for two or three minutes and developed.

Details of three selected and typical experiments are as follows:—

1. 3 minutes' exposure. Developer: quinol 1·5 gr., soda sulphite 3 gr., soda caustic 1·25 gr., water 2 oz. Prolonged development. Colour, warm red-brown.
2. 3 minutes' exposure. Quinol 3 gr., soda sulphite 6 gr., soda caustic 2·5 gr. water 1 oz. Greenish black.
3. 6 minutes' exposure. Quinol 1·5 gr., soda sulphite 3 gr., soda caustic 1·25., water 1 oz. Cool brown.

In all three cases the iodide bath was used. The colours of the first and third are certainly possible colours for pictorial purposes.

Fig. 15. J. T. Mills.

A CHRISTMAS HAMPER.

PRINT CRITICISM AWARD.

Developing P.O.P.

By F. C. LAMBERT.

DEVELOPING a lightly-printed image on P.O.P. is at once an easy and a difficult operation. It is easy to get *a* result, but not too easy to get *the* exact result wanted. The reason is that the colour of the developed picture depends upon several variable factors, and no little care is required to accurately adjust all the factors.

We have several courses open to us. We may print our picture to about three-fourths the depth or strength required and apply a developer to the paper without previous washing (see Fig. 19). Or we may print until the details of the picture are only just or barely visible, then pass the print into a bath of potassium bromide or iodide, wash and apply a developer.

Again we may aim at producing a certain tone-colour by development, or merely aim at producing an image and rely on subsequent gold toning.

The following observations, at the present state of the writer's experiments, seem to be worth noting, though, of course, further experiments probably will call for their modification.

1. If the iodide bath is used the hypo fixing bath should be somewhat stronger than usual, say, 4 oz. per pint.
2. Fixing after iodide takes longer than fixing after bromide bath.
3. A negative was exposed in strips and developed for warm colours by slow weak developer. The *colour* of the various strips was practically the same, but of different degrees of darkness.
4. When a picture is printed out so as to show certain portions considerably in advance of others, these printed-out images usually are, after development, of a warmer colour than the less printed-out portions when the lighter parts show cold tones. In other words, the developed image is not the same colour as the printed-out

and further developed image. So that we get double toning effects.

5. It would seem that slow development tends to warmer, redder tones (Fig. 20). Quick development to blacker and greener colours (Fig. 12).
6. The early stages of quinol, and some other developers, give warm red or orange images. These pass through brown (Figs. 15, 16) and sepia to black. Therefore, to obtain a certain strength of picture and colour, one must adjust the degree of printing so that by the time the colour is reached the strength of the image is also correct.

A moderate negative, inclined to delicacy rather than vigour, may be sufficiently printed by burning 12 inches of magnesium ribbon, 3 to 4 inches away. Care must be taken to move the flame along the face of the negative so as to give all parts even lighting. Wear deep-blue spectacles while burning the ribbon. Rodinal (50 min. per oz.) may be used as a developer.

If the print be bromized, instead of iodized, the developer must be less strong in alkali.

The present writer can offer no opinion as to the permanence of these developed images.

Examples :

1. The warm-red colour, suggested by Fig. 20, may be produced by development. The image was printed from a half-plate negative, by burning 18 inches of magnesium ribbon, 5-6 inches away from the frame set up on edge. The print was put for 1 minute in a 10 gr. per oz. bath of pot. iodide, and developed with water 1 oz., quinol 1½ gr., soda sulphite 3 gr., strong ammonia 30 min. The development was very slow, occupying several minutes.
2. The cool green colour, of Figs. 12, 17, 18, may be obtained by developing an iodized print in metol 3 gr., soda sulphite 20 gr., soda carbonate 20 gr., water 2 oz.

By blending metol and quinol in various proportions and various degrees of dilution, an infinite variety of colours can be obtained, ranging from green-black and blue-black to sienna reds (Figs. 15, 16).

3. Quinol 5 gr., water 5 oz., citric acid 10 gr., soda acetate 100 gr. Print to three-fourths of required strength, and apply developer without previous washing—warm-reds to red-brown tones.
4. Print for detail, next to highest lights, just to be visible. Bath in water 10 ozs., pot. bromide 200 gr. for three minutes. Wash in running water for five minutes. Developer: A. Water 10 oz., quinol 35 gr., pot. metabisulphite 3 gr., pot. bromide, 15 gr. B. Water 10 oz., soda sulphite ½ oz., soda caustic 30 gr. Mix equal parts of A and B just before use. Here is an alternative developer for use after the bromide bath. A. Water 20 oz., quinol 20 gr., soda sulphite 80 gr. B. Water 20 oz., pot. bromide 550 gr., soda carbonate, 440 gr. Use equal parts of A and B. Increasing the proportion of A reduces contrasts in the picture. Increasing B increases the time of development which normally should take about 5 minutes.

Bartolozzi Red and Crimson Red Tones on P.O.P.

By F. C. L.

PRINT somewhat more fully than usual. Then well wash the print and tone in the uranium bath given on page 64. For red chalk tones withdraw the print as soon as the lightest parts have changed to red-grey. For crimson tones carry toning considerably further. After toning soak the print face down on the surface of a deep dish of clean water for quite 10 minutes, then fix in hypo 10% and wash again. Toning should be conducted in very weak daylight. The tendency is to over-tone, as the change of colour during toning does not show very strongly. As prolonged washing will remove the tone it is better to fix the print, wash thoroughly, tone and wash briefly.

Brief Notes on some of the available P.O.P's.

By THE EDITOR.

THE following notes have, for the most part, been abstracted from the printed papers of instructions for working the various samples kindly submitted to the writer by the several manufacturers and agents. These notes are not to be taken as supplanting the printed instructions, but rather as rough jottings as to special features or characteristics here brought together for ready reference. A considerable number of comparative experiments were made which led to the general conclusion that while no two brands of paper seem exactly alike as to speed and colour of printing, or tones subsequently yielded when side by side in the toning bath, yet the differences were surprisingly small.

Roughly, we may group Printing-Out Papers into three classes, viz.: Gelatino-Chloride, Collodio-Chloride, Self-toning Papers. They may have a glossy, matt, or rough surface. The members of any one group are, for the most part, so much alike that the same general lines of procedure apply in all cases. In the appended notes we therefore omit what may be called the usual procedure and merely mention special items of interest.

No significance is to be attached to the order in which the various brands are mentioned.

Wellington P.O.P.—Pink, mauve, white and matt. Formate and phosphate toning baths quoted. "Special" (mauve only) for sulphocyanide bath.

Ilford P.O.P.—Glossy, white, pink, mauve, and "Special" (for producing soft prints from hard negatives). Matt, white—Gold sulphocyanide bath quoted. Soda sulphite added for slowing action and for warm tones.

Kalona Self-toning.—Glossy and matt. Immerse prints without washing in alum and sulphocyanide bath, and fix in separate bath.

Fig. 16. R. Berry.

NOT WORTH A PATCH.

CERTIFICATE ENLARGING COMPETITION.

Barnet P.O.P.—White, pink, mauve, matt. Gold-sulphocyanide toning bath quoted. Phosphate bath may also be used.

Barnet Self-toning.—Glossy and matt. Prints immersed without washing in alum and sulphocyanide bath, and fixed in separate bath.

"Warwick" P.O.P.—Glossy, mauve, matt. Gold-sulphocyanide bath quoted. Black tones obtained by concentrated bath. Warm tones obtained by diluting the bath.

Crossed Swords Platino-Matt P.O.P.—Sepia red, purple, violet and platinum black tones obtained by various baths quoted. The combined toning and fixing bath may be used.

Leto Collodio-Chloride Platino-Matt P.O.P.—Colours obtainable: Brown black, warm black, rich sepia, red brown, dark sepia, by various toning baths quoted. May be dried between blotting paper or before a fire if desired. Does not crack curl, or blister.

Seltona.—Prints go direct from printing frame into hypo fixing bath for warm brown tones, or into salt bath for purple and blue tones.

"Axe" Brand P.O.P.—Glossy, pink, white, mauve, matt. Gold-sulphocyanide bath, also combined fixing and toning bath quoted.

"Luxia" P.O.P.—Glossy, white, pink, mauve, matt. Black or warm tones by modifying degree of concentration of gold-sulphocyanide bath.

Luxia Silvertype Self-toning P.O.P.—The dry print from printing frame is immersed in hypo solution, then washed and dried.

Solio Self-toning.—Matt and glossy. Immerse prints without washing in sulphocyanide bath and fix in separate bath. A salt bath is given as an alternative for the sulphocyanide bath.

Solio, Glossy and Matt.—Range of colours controlled by quantity of gold used. Combined bath quoted. Platinum toning bath quoted for matt paper. Developing formulæ quoted.

Kodak Collodio-Chloride Paper.—Glossy, toned in gold and sulphocyanide. Matt, toned in acid platinum bath.

Apollo Paper.—Tones available, red-brown, warm sienna brown, sepia, purple, black, according to various toning baths quoted. Combined toning and fixing is included in the formulæ.

Siennatype P.O.P.—Matt. Free from double tones. Warm sepia, reddish and brown tones available by washing print in alkaline water, then toning in gold-sulphocyanide bath. For black tones print deeply, tone without washing and fix in bath containing lead and hypo.

Three Star Collodio-Chloride Paper. Glossy and matt. No cracking or curling. Prints twice as fast as sensitized albumen paper. Yields brown, purple or black tones, according to bath employed. Combined toning and fixing may be employed.

Mariona P.O.P.—Glossy, matt and gros grain. Tone in gold-sulphocyanide, or gold and soda carbonate. Sepia tones with matt surface obtained by platinum toning. Development of partially printed image by quinol developer.

Mariona Self-toning.—Tone acquired by immersing in alum and sulphocyanide bath, then washed and fixed. Red and brown tones available.

Mariona Collodio-Chloride Matt Paper. Red, purple, sepia and black tones according to bath used.

Carbona P.O.P.—Matt, glossy or rough. Toning baths: gold, borax, and soda acetate. Colours: warm red, brown, purple, black. A combined fixing and toning bath may be used. Black results obtainable by platinum—citric acid bath. Deep printing and fixing without toning yields red crayon colours.

Glycia P.O.P.—Pink, white, mauve. Toning baths: gold-sulphocyanide or gold-borax. Colours: warm sepia, chocolate or purple, according to quantity of gold used. Combined toning and fixing bath given, also developing formulæ.

Cadett P. O. P.—Glossy, mauve, pink, white. Brilliant and soft brands. Tone of prints more red than usual when leaving printing frame, but resulting tones not thereby affected. Gold-sulphocyanide bath quoted.

Gem P.O.P.—Matt and glossy. Borax and sulphocyanide toning baths quoted. Combined toning and fixing also given.

Imperial P.O.P.—Pink, white, mauve, red, brown, purple tones obtained by gold-sulphocyanide bath quoted.

Imperial Self-toning P.O.P.—Prints first pass to bath of alum and sulphocyanide and subsequently to hypo fixing bath.

Criterion P.O.P.—Glossy, mauve, pink and white. Warm or black tones at command by varying the proportions of gold and sulphocyanide bath quoted.

Paget P.O.P.—Glossy and matt. Gold and sulphocyanide (optional with soda sulphite) toning bath quoted.

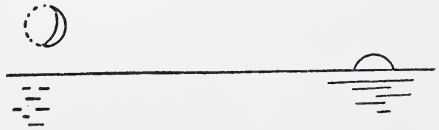
Paget Self-toning P.O.P.—Wash after printing, then fix and again wash.

Paget Collodio-Chloride. — Pink and mauve. Toned in gold sulphocyanide or in combined bath.

Luna.—Smooth, rough, laid. Tissues, silk, linen. Platinum toning bath quoted. Metol developing formula given.

Apex Self-toning P.O.P.—Print fully and fix in Hypo.

Venus.—Rough and smooth papers, and canvas textures. Satin, silk, linen, etc.



P.O.P.

Formulæ, Notes, Hints, etc.

By THE EDITOR.

Intensifying.

1. Immerse the print in a saturated solution of mercuric chloride. When all visible change ceases, wash thoroughly. Then immerse in water 1 oz. Strong liquid ammonia 20 drops. Wash for 10 minutes.

Reducers.

1. Water 1 oz., uranium nitrate 5 gr., hypo 25 gr.
2. Water 1 oz., pot. ferricyanide 1 gr., ammon. sulphocyanide 10 gr.
3. Water 1 oz., hypo 3 drms., potass iodide 3 to 5 gr.
4. Water 1 oz. Saturated solution of iodine in alcohol 10 drops. Put this in a white tea cup and add saturated solution of potass. cyanide until the pale yellow tint is discharged (about 15 drops may be required).
6. Ammonium persulphate 5-10 gr., water 1 oz. The print must be quite free of hypo or the action may be irregular.
7. Potass. cyanide 10 grains, water 1 oz.

Hardening Baths.

1. Water 10 oz., alum ½ oz.
2. Water 10 oz., alum ¾ oz., salt ½ oz.
3. Water 10 oz., chrome alum 10 gr., salt ½ oz.
4. Commercial formalin solution (40 % formaldehyde) 1 to 2 parts, water 20 parts.

No. 3 suitable for tropical climates.

Five minutes' immersion in any of above followed by at least ten minutes' washing in flowing water.

Fixing Bath.—Hypo 3 oz., water 1 pint. Various authorities give from one to four ounces of hypo per pint, but the above advised proportions are supported by experience and authority. Time of fixing, 10 to 15 minutes at temperature 60—65° F. 2 ozs. of hypo should be allowed for each sheet of paper, *i.e.*, 8 whole-plate or 32 quarter-plate prints.

Fig. 17. A LONELY SHORE. A. E. Thwaite.

Fig. 18. THE ROAD THROUGH THE PASS. O. A. Walker.

PRINT CRITICISM AWARD.

Fig. 19. F. C. L.

PRINT BEFORE DEVELOPMENT.

Fig. 20. F. C. L.

PRINT AFTER DEVELOPMENT.

(See p. 53.)

Toning Baths.

Gold.—1. Water 10 oz., am. sulphocyanide 10 gr., gold chloride 1 gr. (Figs. 11, 5, 8).

2. Water 10 oz., am. sulphocyanide 10 gr., gold chloride 1 gr., soda sulphite 1 gr.
3. Water 10 oz., am. sulphocyanide 7 gr., am. carbonate 2 gr., gold chloride 1 gr.
4. Water 10 oz., am. sulphocyanide 7 gr., am. carbonate 2 gr., alum 5 gr., gold chloride 1 gr.
5. Water 20 oz., soda phosphate 30 gr., gold chloride 1 gr. (Make with warm water and use as soon as cold).
6. Water 15 oz., soda phosphate 30 gr., soda carbonate 1 gr., gold chloride 1 gr. (Yields warm browns and purples).
7. Water 10 oz,, soda phosphate 24 gr., soda bicarbonate 6 gr., gold 1½ gr.
8. Water 10 oz., borax 30 gr., gold chloride 1 gr. (Warm sepia tones).
9. Water 10 oz., borax 25 gr., soda acetate 50 gr., gold chloride 1 gr.
10. Water 10 oz., borax 30 gr., soda carbonate 1 gr., gold chloride 1 gr.
11. Water 10 oz., soda acetate 30 gr., gold chloride 1 gr. (Print fully).
12. Water 10 oz., soda acetate 30 gr., soda carbonate 1 gr., gold chloride 1 gr. Prepare with hot water and use when cold. If used at once the print is considerably reduced.
13. Water 10 oz., soda acetate 30 gr., soluble saccharine 1½ gr., gold chloride 1½ gr. Gives warm brown tones.
14. *(a)* Water 15 oz., soda formate 15 gr., soda carbonate 2 gr., gold chloride 1 gr.
    (b) Water 20 oz., soda formate 7 gr., soda carbonate 1½ gr., gold chloride 1 gr.
15. Water 10 oz., soda tungstate 20 gr., gold chloride 1 gr.
16. Water 10 oz., soda tungstate 30 gr., soda carbonate 1 gr., gold chloride 1 gr.
17. Water 10 oz., washing soda 2 gr., gold chloride 1 gr.
18. Water 12 oz., soda picrate 36 gr., gold chloride 1 gr.
19. Water 10 oz., soda molybdate 30 gr., gold chloride 1 gr.
20. Water 15 oz., soda malate 30 gr., gold chloride 1 gr.
21. Water 10 oz., soda succinate 45 gr., gold chloride 1 gr.
22. Quick-acting Bath. Water 5 drms., am. sulphocyanide 7 gr., soda phosphate 5 gr., borax 7 gr., gold chloride 1 gr. Apply to print with brush or cotton wool without previously washing the print.
23. Quick toning without previously washing.
    A. Water 1 oz., gold chloride 1 gr.
    B. Water 1 oz., am. sulphocyanide 15 gr.
    Add A to B slowly.
24. Water 10 oz., formaline (40 per cent. solution) 20 min., gold chloride 1 gr.

25. Concentrated Toning Bath. Dissolve contents of one ounce bottle of am. sulphocyanide in ¾-oz. tepid pure water. Dissolve 15 gr. gold chloride in ¼-oz. water and add to sulphocyanide solution. Make up to 2 oz. with pure water. For use shake and add one part stock solution to 15 parts warm water. Use when cold.

Combined Toning and Fixing.

1. Water 10 oz., hypo 4 oz., lead acetate 5 gr., gold chloride 2 gr., powdered chalk ¼ oz. Shake and decant clear part for use.
2. Water 16 oz., hypo 3 oz., am. sulphocyanide 3 drms., gold chloride 7 gr.
3. Water 16 ozs., lead acetate 60 grs., soda acetate 20 grs., hypo 3 ozs., soda carbonate 30 grs., alum 1 drm., gold chloride 3 grs.
4. Water 10 ozs., hypo 1 oz., citric acid 2 grs., alum 20 grs., lead acetate 7 gr., gold chloride 1 gr.

Toning Baths.

Platinum. 1. Water 10 oz., citric acid 80 grs., pot. chloroplatinite 3 grs.

2. Water 10 ozs., phosphoric acid 60 mins., pot. chloroplatinite 3 grs.
3. Water 10 ozs., phenylenediamine hydrochloride 2 grs., pot. chloroplatinite 2 grs. (Figs. 14, 4).
4. Water 10 ozs., nitric acid 3 mins., pot. chloroplatinite 3 grs.
5. Water 10 ozs., latic acid 1 drm., pot. chloroplatinite 2 grs.

Combined Gold and Platinum Toning.—In this case the print is partly toned (to a warm brown) in a gold bath then washed and again toned in a platinum bath, washed in an alkaline bath and fixed in the usual way. Print rather deeper than usual. Wash in: Water 1 quart, table salt 1 oz., washing soda ½ oz. Rinse well and tone in: Water 10 ozs., borax 120 grs., gold chloride 4 grs.; *or* Water 10 ozs., soda carbonate 3 grs., gold chloride 1 gr. Wash and tone in: Water 10 ozs., phosphoric acid 2 drms., pot. chloroplatinite 6 grs.; *or* Water 10 ozs., lactic acid ½ drm., pot. chloroplatinite 5 grs. Wash in: Water 20 ozs., soda carbonate ½ oz. Fix and wash as usual. Too long in the gold bath may yield double tones. If not long enough the print may be too brown-black. If the print loses strength in the gold bath more soda carbonate is required. By using the acetate bath No. 11, p. 61, a greenish tinge is imparted. The object of two tonings is to obtain a rich black.

Toning Baths for Collodio-Chloride Papers.

1. Water 16 ozs., am. sulphocyanide 30 grs., gold chloride 2 grs. (warm purples and browns).
2. Water 30 ozs., gold chloride 1 gr., soda bicarbonate 8 grs. (For matt papers).
3. Water 20 ozs., gold chloride 3 grs., soda acetate 60 grs., borax 90 grs., am. sulphocyanide 60 grs. (Purple and black tones).
4. Water 25 ozs., gold chloride 1 gr., soda acetate 30 grs. (Greenish black tones).
5. Water 10 ozs., gold chloride 3 grs., hydrochloric acid 3 ozs. (Violet and purple black tones).
6. Water 12 ozs., borax 40 grs., gold chloride 1 gr. (Warm black tones).
7. Water 15 oz., phosphoric acid (8.G. 1-20) 1 drm., pot. chloroplatinite 6 grs. (Warm tones).
8. Water 15 ozs., lactic acid 15 mins., pot. chloroplatinite 4 grs. (Cool tones).
9. Water 15 ozs., hydrochloric acid 30 mins., oxalic acid 60 grs., pot. chloroplatinite 5 grs.
10. Water 6 oz., phenylenediamine 1 gr., pot. chloroplatinite 1 gr.

Combined Toning and Fixing for Collodio-Chloride Papers (To be used without previously working the prints). 1. Water 4 ozs., hypo 1 oz., am. sulphocyanide 48 grs., lead acetate 18 grs., citric acid 14 grs., gold chloride 1 gr. Prepare with warm water and allow to stand 12 hours before use. The prints must be in the bath *at least 7* minutes in order to be thoroughly fixed, and 10 minutes is preferable.

2. Water 8 oz., hypo 1 oz., alum ¼ oz., glauber salts ¾ oz., lead acetate 8 grs., gold chloride 2 grs.

Developers for P.O.P.

1. Water 4 ozs., gallic acid 3 grs., acetic acid 6 mins.
2. Water 4 ozs., dry pyro 4 grs., pot. bichromate 1 gr.
3. Water 1 oz., soda acetate 12 grs., pyrocatechin 6 grs.
4. Water 4 ozs., acetic acid 6 mins., pyrocatechin 5 grs.
5. Water 20 ozs., soda sulphite 90 grs., sulphuric acid 12 mins., quinol 60 grs., eikonogen 24 grs., pot. carbonate 180 grs., pot. bromide 24 grs.
6. Water 10 ozs., soda sulphite 50 grs., pot. bromide 1 gr., metol 1 gr., acetic acid 3 drms.
7. Water 10 ozs., acetic acid 2 drms., metol 5 grs., pyro 5 grs.
8. Water 10 ozs., soda sulphite 30 grs., amidol 4 grs., caustic soda 12 grs.
9. Water 1000 parts, soda sulphite 50 parts, sodium bromide 1 part, metol 1 part, acetic acid (60%) 200 parts, citric acid 100 parts (Luna Developer).

Alkaline Bath previous to Toning for Yellow Tones. Water 20 ozs., pot. carb. 5 drms.

Bath to Stop Gold Toning.—Soda sulphite ¼ oz., water 20 ozs.

Bath to Stop Platinum Toning.—Soda carbonate ½ oz., water 20 oz.

Gold and Platinum Single Toning Bath.—In this case but one toning bath must be used, and that contains gold and platinum. The prints must be well washed, and the bath in a neutral condition. Prepare as follows: A. Water 4 ozs., soda acetate 50 grs., gold chloride 1 gr. B. Water 4 oz., pot. chloroplatinite 1 gr. Add B to A. The bath is now probably alkaline. Throw in a bit of red litmus paper. Then add dilute nitric acid or phosphoric acid drop by drop until a fresh bit of red litmus paper does not change colour.

Uranium Toning.—Water 1 oz., acetic acid 1 drm., uranium nitrate 2 grs., pot. ferricyanide 2 grs. Print deeply; wash well; tone in above. Soak face down in clean water, fixing in hypo 2 ozs., water 20 ozs. for ten minutes. Pink and red tones obtainable. (See pp. 20 and 64 in No. 1).

Spotting Medium.—For matt prints, water colour and water is all that is required. For glossy prints we must employ some medium which dries with a shiny surface.

1. Gum water to the consistency of golden syrup.
2. Gum arabic 2 parts, honey or candy sugar 1 part dissolved in water to a creamy consistency.
3. White of egg well beaten up, then allowed to settle and filtered through a bit of tow.

Collodion for Enamelling.

Celloidin 30 grains, ether 5 oz., alcohol 1 oz.

Mountants.

1. Starch powder a teaspoonful, cold water three teaspoonsful. Rub to smooth paste. Slowly pour on boiling water until the milk-like appearance changes to a clear jelly. Add the hot water slowly and stir vigorously. Use when cold.
2. Gelatine 1 oz. Soak in 3½ oz. cold water until quite soft, then melt by gentle heat. Add glycerine ¼ oz. and add slowly 1½ oz. alcohol, stirring all the time. Suitable for mounting glossy prints.
3. Dissolve white shellac in alcohol to the consistency of cream. Brush this on the back of the print and let it dry. Lay the print in position. Cover with smooth glazed paper and quickly pass over a warm flat iron. Suitable for retaining glazed surface.
4. Dextrine 75 grs., water 2 drms., alum 3 grs., sugar candy 12 grs., alcoholic solution of thymol (10 per cent.) 5 drops.
5. Gelatine 40 grs., water 2 drms. When dissolved add chloral hydrate 20 grs. and neutralize with soda carbonate.

Awards.

Enlarging Competition.—The entries for this very interesting competition were again in excess of our anticipations, not only as regards numbers, but also in general quality. There was not a single print sent in which was not a credit to its producer, and considerably more than half were up to exhibition standard. After repeated examination the awards were finally cast as follows:—Silver Plaque: **S. E. Fincham** (Dulwich), "Fittleworth Old Mill." Bronze Plaque: **B. B. M. Olivena** (Instow), "Evening Reflections." Certificate: **R. Berry** (Blackwood), "Not worth a Patch." Extra Certificate: **H. Light** (Birmingham), "An Old Fisherman." Highly commended: **J. Yowatt** (Didsbury), "Cloisters. Beleur." **S. M. Rudd** (Rawdon), "Flowers." There are some ten or eleven other competitors who pressed very closely indeed those just mentioned, who we feel quite sure will gain awards ere long. A considerable number of prints only just failed to get into the first-class by reason of a slight excess of light and shade contrast.

Will readers please bear in mind that it is quite impossible to give a satisfactory impression of an enlargement by reducing it as we are obliged to do to suit our page size?

Print Criticism Awards.—Each month brings us an increasing number of prints for criticism which we take to be a matter gratifying to our vanity, and leading us to think that the criticisms are found of practical service. At the same time this growing monthly muster necessitates delay, as the awards cannot be made until all the prints for the month are in hand. Will senders bear this in mind and indulge us with all the patience possible? The Editor is anxious to give every print his own careful and personal examination before offering any criticism. The awards for the month of December are:—**Mrs H. Morgan** (Westgate-on-Sea), "My Little Son"; **Miss Walker** (Corwen), "Near Llangollen; **J. T. Mills** (Newark), "A Christmas Hamper." Two extra prizes have been divided between **Miss M. Bruce** (Campden), "A Portrait"; **J. R. H. Oldham** (Brampton), "Playmates"; **A. E. Thwaite** (Durham), "A Lonely Shore"; **O. A. Walker** (London), "The Road through the Pass," in consideration of their very close proximity to the three first pictures of the month.

Broken Rules again call for notice. Several enlargements arrived one or more days late. In one instance no name or address was given. Another competitor sent four prints, etc. Infractions of our very necessary rules involve disqualification.

Please Take Notice that of prints sent up for competition or criticism, the return postage *must be sent with the pictures* and not afterwards.

Notes on some of our Illustrations.

A. E. Thwaite (Durham).—"A Lonely Shore." An interesting example of an exceptional case when a long spread out foreground is both a useful and an important part in the general composition. This may be seen by covering up the lower two-thirds, when the remainder becomes quite ordinary. This also is useful in showing how small the true size of the sun is as compared with the usual painter's setting sun. Fig. 17.

Miss Walker (Corwen).—"Near Llangollen." An admirable and graceful composition showing that chiaroscuro is the most important part of picture-making. The original print shows somewhat over-strong patches of light and shade which are slightly subdued in the reproduction. The trimming and mounting were somewhat careless and had to be rectified. The tint and tone of mount in excellent taste. The leading lines of the composition should be noted. Fig. 12.

B. B. M. Olivena (Instow).—"Evening Reflections. As a rule reflections look more pictorial in nature than they prove in photography, but "to every rule exceptions." The great charm of this picture is due to its broad and large effect of light and shade distribution and betokens a pictorial taste considerably beyond that shown in the average photograph. The water would be vastly improved by being toned down a little. Fig. 13.

J. R. H. Oldham (Brampton).—"Playmates." Here is some excellent technical quality. The two buttons are too conspicuous, and require very carefully scraping down on the negative so as to print darker. The girl is staring too much. Fur quality of cat is exceptionally good. Figure requires a trifle more clear margin. At present the picture space is over-crowded. The original had a light band round the print which is purposely omitted in the reproduction. Fig. 14.

S. E. Fincham (Dulwich).—"Fittleworth Old Mill." The excellent general quality of this bold enlargement cannot be adequately rendered on a small scale. The composition, though admirable, might be improved by a little more sky, giving the feeling of space and reducing the present squareness. The weak point is the rather too strongly marked clouds. A quieter sky would be more in harmony with the peaceful sentiment of the scene. The suggestion of movement of water is excellently rendered. Fig. 10.

Mrs. H. Morgan (Westgate-on-Sea).—"My Little Son." Excellent work throughout, Exposure, development and printing all good. Pose and expression quite childlike; but one is puzzled to know the nature of the curious structure upon which the little fellow is seated. The strong light on boy's legs should be slightly subdued, so that the little boat may be the focus of light and interest. A less "liney" seat would have given more importance to the figure itself. Fig. 11.

R. Berry (Blackwood).—"Not worth a Patch." Another excellent example of an unconventional and homely subject, yielding an interesting picture. A quiet background has wisely been used. The figures have appropriate dress, expression and pose. The original enlargement is somewhat flat, but is improved by being brought down in size. The pictorial quality of this example is somewhat in advance of its technical merit. This hint should help the worker to better work in the near future. Fig. 16.

J. T. Mills (Newark).—"A Christmas Hamper." The subject is happily chosen for the time of year when the print was made. General technical quality of print excellent. Trimming somewhat carelessly done. A little more quiet background space required. This print conveys the useful hint that the subject for a picture may often be found without going outside one's own house. The texture quality of the fur is particularly praiseworthy. (Details: Warwick Ins., *f*/16, 14 sec., pyro soda, Barnet P.O.P.) Fig. 15.

Miss M. Bruce (Campden).—"A Portrait." Not a very forceful title (see *Practical Photographer* No. 4, page 38); a matter of more importance than many workers adequately realize. The reproduction hardly does justice to the excellent rendering of the light draperies. Simplicity of composition should be carefully noted. Pose of figure suggests that of leaning back too much without adequate support. Mounting of original print somewhat faulty. Fig. 9.

O. A. Walker (London).—"The Road through the Pass." In this example we have all the elements of a good picture—yet a few small matters present are enough to make it fall just short of entire success. The white bevel of mount we purposely omit. Upper part of sky too light compared with lower part. Patch of water and stone to right foreground require subduing. Near part of road too wide compared with mid-distance (result of too short focus of lens). Atmosphere excellently suggested. General composition good. Fig. 18.

Die Photographische Kunst im Jahre, 1903, is an interesting and valuable volume of articles and pictures by many leading writers and workers. Portraiture, Gum, Lighting, Colour Photography, etc., are ably dealt with by Professor Sallwurk, Otto Ewel, E. R. Weiss, Dr. Miethe, etc. There are some dozen or more full-page plates and about a hundred others interspersed in the text. The editor, printer and publishers are to be congratulated on the production of a work of exceptional merit. (Price 8 marks. Wm. Knapp. Halle: Saale.)

Messrs. Evans Sons Lescher & Webb (56, Hanover Street, Liverpool) send us a price-list circular of enlarging lanterns most tempting in design and price. For example, The Pembroke, with 5½-inch condenser, complete with objective, 70s., or 43s. without objective. The Hanover, at a slightly higher price, is splendid value. Two forms of lantern slide making cameras, 25s. and 27s. 6d., should be noted. A post-card naming this journal with bring a copy of this admirable list.

Messrs. Kodak have sent us a sample of adhesive backing paper, which is admirably calculated to simplify the working of glazing, as described on page 23. A sheet of this (coated) paper is cut a trifle larger than the print and squeegeed to the glass or ferrotype. It is now soaked in water for a few minutes and then laid down with the shiny or coated side in contact with the back of the print supported on the glass plate. The two are brought into close contact by the aid of a squeegee, care being taken to avoid enclosing air bubbles between the two papers. When quite dry the point of a knife is inserted between the print and glass, when the print and backing (now closely adhering) are readily detached from the glass.

The last three numbers of the *Photo-Miniature Series* deal with Pictorial Principles, Outdoor Exposures, and Architectural Photography, in the usual agreeable manner of this series.

Messrs. A. & M. Zimmermann (3, Lloyds Avenue, E.C.) send us samples of their Leto Gaslight Paper, rough matt and smooth matt surfaces; adurol or metol-quinol, recommended as developers. The paper has a specially hard surface and is remarkable for its freedom of fog. Two qualities, which have only to be mentioned to be appreciated.

From Messrs. Maclaurin (Gainsboro') we have received an elegant card calendar in two shades of quiet grey. An opening is provided, so that one may change the photography month by month to suit the season of the year.

Messrs. H. F. Purser (35, Charles Street, Hatton Garden, E.C.) are desirous of purchasing the right of reproduction and copyright for advertising purposes, of landscapes, seascapes, shipping, street scenes, local scenery, etc., *taken with Busch Lenses.* Prints and other communications to be sent direct to Messrs. H. F. Purser, accompanied by particulars as to kind of Busch Lens used, aperture, exposure, etc., mentioning this journal.

Mr. W. C. Hughes (82, Mortimer Road, Kingsland, N.) sends us a fascinating pamphlet describing his new Alphengo, *i.e.*, a reflecting lantern for day or night use, without condensers. Usable with all kinds of light. Always ready. For enlarging, reducing, slide-making, showing opaque objects, etc. We look forward to seeing this instrument in action, when we shall be able to give further details. Meanwhile, readers are invited to write for descriptive pamphlet, and mention this journal.

Messrs. Günther Wagner (10, London Wall, E.C.) send us samples of transparent albumen colour and preparatory medium for tinting and colour photographs. The medium is liquified by standing the bottle in warm water. It is then brushed over the print. When dry, the coating is hardened by a coat of formalin. The pigments are liquids of very beautiful and pure colours, which may be diluted with water or medium and blended to any required shade. These colours will be appreciated by makers of lantern slides and post-cards. This firm also have a splendid range of water-proof drawing inks.

R. R. Beard (10, Trafalgar Road, Peckham, S.E.) sends us a catalogue of optical lanterns, cinematographs, jets, carriers, finders, lecturer's lamps, and the "hundred and one" items in connection with lantern matters. Every lanternist should make a point of securing a copy of this very comprehensive list, by sending a post-card and naming *The Practical Photographer.*

From Messrs. J. E. Lockyer (224, Evelyn Street, Deptford, S.E.) come convenient cardboard tube packages of acid hypo fixing salt. That selling at 1½d. contains enough to make 10 ozs. of bath, while the 3d. sizes contain three such charges, *i.e.*, enough for 30 ozs. We are told that this bath is quicker and cheaper than ordinary hypo, hardening the film and preventing frilling—an obvious convenience for the tourist or occasional worker.

Messrs. Dawbarn & Ward are to be congratulated on their enterprise in providing a series of Penny Photographic Pamphlets. The first four deal with (1) Halation, (2) Colour Correct Photography, (3) How a Lens Works, (4) The Camera and its Movements. These tracts are simply written, suitably illustrated, and will assuredly meet with a well-deserved wide recognition.

Wellcome's Photographic Exposure Record and Diary, 1904 (Burroughs Wellcome & Co.), may not inaptly be called a photographer's tabloid library. For within its tastefully coloured covers is condensed a surprising range of reliable and useful information upon Development, Time Factors, Formulæ galore, Fixing, Hardening, Hypo Elimination, Exposure Hints, Tables and Automatic Calculating Disc, Speed of Plates, Diary and Photographic Record —truly a generous shilling's worth.

An exhibition of Messrs. Cherry and Richard Kearton's natural history photographs of unexcelled excellence and interest is on view until February 3rd, at the Modern Gallery, 175, Bond Street, and should certainly be visited by all interested in natural history or hand camera work.

P.O.P. Fabrics.—It is of special interest in connection with this number to note that Messrs. Lucien Allègre & Co., 59a, Oxford Street, also the Photographers' Art Paper Company, Parchmore Road, Thornton Heath, are supplying sensitized silk and linen in cut pieces and rolls for printing-out and toning. These may be used for "a thousand and one" decorative purposes, *e.g.*, fans, d'oyleys, etc.

Penrose's Pictorial Annual, 1903-4 (Edited by W. Gamble, printed by Percy Lund, Humphries & Co. Ltd., Bradford)—This is a sumptuously illustrated record of all that is best in the way of Process Pictorial matter and illustrations. Taking at random half a dozen writer's names, we find Dr. Clay, General Waterhouse, Frank M. Sutcliffe, Chapman Jones, Max Levy, W. Gamble. These will suffice to show the high quality of the literary matter. As to the illustrations one cannot say more than that this year's volume marks an advance on the eight previous yearly numbers. In a word, no one interested in process illustration can *afford* to be without this standard work. It reflects the greatest possible credit on all who have been concerned in its production, and we are proud to know that it is in every sense an English-made book.

New Lens by Aldis Brothers.—We have just had the great pleasure of testing in the camera a specimen lens of a new series by this well-known firm, and may at once say that the results are conspicuously satisfactory and *amply* fulfilling the claims made for it. Details:—No. 7, Series III.: Aldis patent anastigmat, 7½ in. equivalent focus; 6·7 in. back focus; iris diaphragm; apertures ranging from *f*/7·7 to *f*/64; nominally for ½-plate (though it covers a much larger plate than this); mounted in B. & L. "Unicum" smallest size shutter and is perhaps the most compact lens and shutter, for its covering power, on the market. Among the features which struck our attention was the remarkable *uniformity* of good definition with full aperture, giving just the kind of result that one usually desires in a negative designed for enlarging or lantern slide making. Lastly, but not of least interest, the price is surprisingly moderate (£3 - 3 - 0) for an instrument of such high-class character.

Messrs. Butcher send us a sample of P.O.P. especially made for them by a firm whose name is synonymous with unsurpassed quality. The special feature is that each packet of paper is enclosed *(gratis)* in an ingeniously contrived stout tough paper case shaped like a pocket letter holder. This serves as an admirable receptacle for specimen prints, memoranda, letters, bank notes and other impedimenta. Two pairs of eyelet holes are provided so that a bit of thin string converts the case into a package for posting. Directions for working the P.O.P. are printed inside the case, and are, therefore, convenient for reference.

Messrs. Hinton & Co. (38, Bedford Street, Strand), supply an ingenious contrivance (called a mounting and squeegeeing board) whereby several sheets of tough, fibrous blotting paper and rubber cover are clamped to one end so that both hands are free for placing the print, squeegeeing, etc. A useful aid to the P.O.P. worker.

A Bound Edition of the Practical Photographer.—We have received intimation from several hon. secs., librarians and others, that a cloth-bound edition would be welcome. If those of our subscribers who wish to have this edition will kindly write us their views on the subject, we will do our best to meet their wishes. Will correspondents writing to us say whether they would prefer to have binding covers issued at the end of each month or six months, or have each monthly number issued as a bound book?

Notice.—Mounting Competition; an important correction.—By an unfortunate oversight the closing date of this competition was printed in our last number as January 31st. This should be corrected to March 1st.

Professional and Trade Advertisements.

ADVERTISEMENTS OF PHOTOGRAPHIC BUSINESSES FOR SALE AND WANTED, SITUATIONS WANTED AND VACANT, MISCELLANEOUS, PROFESSIONAL AND TRADE ANNOUNCEMENTS are inserted at the rate of one penny per word, minimum 1/-.

Advertisements should be sent not later than the 12th of the month, with remittance to Advertising Dept., 27, Paternoster Row, London, E.C.

'The "Nature" Series of Mounts.

The system of mounting on stout paper instead of cardboard is fast gaining ground on account of its manifold advantages, viz.: smaller space occupied, greater ease in storing, with less wear and tear, infinite variety possible, and more tasteful appearance of the photographs. 'Nature' Papers are admirably adapted for the new American System of mounting, for passe-partouts, etc. Two thicknesses can be obtained. In order to mount without cockling, use very stiff paste, spread sparingly, roll well with squeegee, and place under a board or book. These papers may be had in the sheet or in cut sizes. Prices below. Portfolios for holding prints mounted on cut sizes are made. See price list below.

In 1/0 Packets.

To take sizes up to ¼-plate.

Ordinary Thickness. Contains No. sheets 8×6 in.			Extra Thick Series. Contains No. sheets 8×6 in.	
A	48	assorted colours	**A0**	32
A1	48	grosvenor green	**A01**	32
A2	48	duffel gray	**A02**	32
A3	48	gray bark	**A03**	32
A4	48	playfield cream	**A04**	32
A5	48	rough white	**A05**	32
A6	48	dove	**A06**	32
A7	48	deep sea blue	**A07**	32
A8	48	autumn brown	**A08**	32
A9	48	smoke gray	**A09**	32
A10	48	fern green	**A010**	32
A11	48	coffee	**A011**	32
A12	48	wine red	**A012**	32
A13	48	black	**A013**	32
A14	48	olive green	**A014**	32
A15	48	iron gray	**A015**	32
A16	48	russet	**A016**	32

To take sizes up to ¼-plate.

Ordinary Thickness. Contains No. sheets 10×8 in.			Extra Thick Series. Contains No. sheets 10×8 in.	
B	36	assorted colours	**B0**	24
B1	36	grosvenor green	**B01**	24
B2	36	duffel gray	**B02**	24
B3	36	gray bark	**B03**	24
B4	36	playfield cream	**B04**	24
B5	36	rough white	**B05**	24
B6	36	dove	**B06**	24
B7	36	deep sea blue	**B07**	24
B8	36	autumn brown	**B08**	24
B9	36	smoke gray	**B09**	24
B10	36	fern green	**B010**	24
B11	36	coffee	**B011**	24
B12	36	wine red	**B012**	24
B13	36	black	**B013**	24
B14	36	olive green	**B014**	24
B15	36	iron gray	**B015**	24
B16	36	russet	**B016**	24

To take sizes up to ¼-plate.

Ordinary Thickness. Contains No. sheets 12×10 in.			Extra Thick Series. Contains No. sheets 12×10 in.	
C	24	assorted colours	**C0**	16
C1	24	grosvenor green	**C01**	16
C2	24	duffel gray	**C02**	16
C3	24	gray bark	**C03**	16
C4	24	playfield cream	**C04**	16
C5	24	rough white	**C05**	16
C6	24	dove	**C06**	16
C7	24	deep sea blue	**C07**	16
C8	24	autumn brown	**C08**	16

To take sizes up to ¼-plate.

Ordinary Thickness. Contains No. sheets 12×10 in.			Extra Thick Series. Contains No. sheets 12×10 in.	
C9	24	smoke gray	**C09**	16
C10	24	fern green	**C010**	16
C11	24	coffee	**C011**	16
C12	24	wine red	**C012**	16
C13	24	black	**C013**	16
C14	24	olive green	**C014**	16
C15	24	iron gray	**C015**	16
C16	24	russet	**C016**	16

The Ordinary Papers are also supplied in large sheets (28×26 in.), price **2/6** per quire.
The Extra Thick Papers are also supplied in large sheets (28×26 in.), at **3/6** per quire of 24 sheets.

OF ALL DEALERS,

or of PERCY LUND, HUMPHRIES & CO., LTD, Bradford and London.

Printed for the Proprietors, Messrs. Hodder & Stoughton, 27, Paternoster Row, London, E.C., by Percy Lund, Humphries & Co., Ltd., The Country Press, Bradford; and 3, Amen Corner, London, E.C.

BARNET

GASLIGHT

Glossy · PAPER · & Matt

Prints can be made in any sitting room
after the day's work *by GASLIGHT.*
NO DARK ROOM REQUIRED.

Sole Manufacturers
ELLIOTT & SONS LTD.
BARNET, ENGLAND.